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S poštovanjem,

Dr Dejan Kojić, vanredni profesor
Glavni i odgovorni urednik

EDITORS' INTRODUCTION

Dear fellow authors, distinguished readers,

In the front of you is the first issue of the scientific journal of social and technological development - STED Journal in 2025, published by the University of Business Engineering and Management. The first issue in 2025 includes 8 papers. Published papers have got a positive evaluation by at least two independent reviewers. Reviews are anonymous and reviewers do not know the authors identity. Reviewers have also suggested the sorting of papers into scientific and expert categories. Reviewers have given their consent for publishing of paper based on their assessment of originality, novelty, used methodology and literature of paper.

Each paper has been assigned COBISS and UDC number by the National and University Library of the Republic of Srpska. Each paper is assigned a DOI number. The journal has its analytically revised articles which are published in the current national bibliography, and it is included in the central electronic catalogue. All members of the editorial board have scientific or educational titles from the narrow scientific fields covered by the journal. The journal is included in the ERIH+, DOAJ, CEEOL, INDEX COPERNICUS, GOOGLE SCHOLAR and OPAC citation databases.

On the last pages of the journal, there is also the bibliography of papers published in the second issue in 2024.

We thank the reviewers of papers whose professionalism and critical approach have greatly contributed to the quality of published papers.

With best wishes,

Dr Dejan Kojić, docent
Editor-in-Chief

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APSTRAKT

Pojam „životnog stila” je centralni koncept Adlerove teorije ličnosti koji on definiše kao karakteristični obrazac ponašanja koji je manifestacija jedinstvenog načina percepiranja, konceptualizacije, ponašanja i ličnog stremljenja ka cilju koji je ispunjen subjektivnim značenjem i predstavlja deo težnje ka moći (Croake, 1975). Osobine ličnosti predstavljaju dimenzije individualnih razlika koje se odnose na tendenciju osobe da ispoljava konzistentne obrasce misli, osjećanja i radnji (McCrae, & Costa, 1985). Uzorak istraživanja se sastojao od ukupno 211 ispitanika, pretežno studenata Univerziteta u Istočnom Sarajevu anketiranih putem onlajn upitnika od kojih je bilo 135 ženskog i 76 ispitanika muškog pola. Korišćeni su mjerni instrumenti zadovoljavajućih mjernih karakteristika: Upitnik za ispitivanje modela ličnosti Velikih pet (Goldberg, 1990), modifikovana verzija Olport-Vernon-Lindzijeve skale vrijednosti za mjerenje životnih stilova, Skala za ispitivanje sociodemografskih karakteristika ispitanika i Skala za ispitivanje akademske uspješnosti. Dobijeni podaci pokazuju da od svih dimenzija ličnosti modela Velikih pet jedino savjesnost statistički značajno pozitivno korelira sa ostvarenim akademskim uspjehom izraženim kroz prosječnu ocjenu na studijama (*rho=.2465*) što ne čudi, jer je ovo osobina koja je u velikom broju istraživanja dosljedno povezana sa akademskim i poslovnim uspjehom. Četiri stila života statistički značajno koreliraju sa ostvarenim akademskim uspjehom: porodično-sentimentalni stil (*rho=.15*), saznajni stil (*rho=0.167*), stil orijentisan na popularnost (*rho=-.198*) i prometejski aktivizam (*rho= .149*). Iako nijedna od navedenih korelacija nije visoka, one upućuju na nesumnjivo postojanje povezanosti između ovih konstrukta i ulogu koju stilovi života kao složeni sistemi vrijednosti, ciljeva, stavova i vjerovanja igraju u određivanju konačnih oblika ponašanja i ostvarenih rezultata unutar obrazovnog sistema. Takođe, od svih životnih stilova koji su uključeni u prediktivni model, samo je životni stil orijentisan na popularnost bio statistički značajan i negativan prediktor akademskog uspjeha.

Ključne riječi: osobine ličnosti, životni stilovi, akademski uspjeh

UVOD

Pojam „životnog stila" je centralni koncept Adlerove teorije ličnosti, a shvatanje stila života određenog klijenta se smatra kao neophodan korak terapijskog procesa i razumijevanja ciljeva njegovog ponašanja (McCarty, & Christian, 2020). Ovaj termin se u Adlerovoj teoriji definiše kao karakteristični obrazac ponašanja koji je manifestacija jedinstvenog načina percepiranja, konceptualizacije, ponašanja i ličnog stremljenja ka cilju koji je ispunjen subjektivnim značenjem i predstavlja deo težnje ka moći. Iako nasljeđe i sredina utiču na formiranje životnog stila, oni ne predstavljaju njegove determinantne, tj. adlerijanska psihologija naglašava slobodu pojedinca da u okviru granica koje postavljaju nasljeđe i sredina ostvari sopstvene izbore (Croake, 1975). Kroz ove adaptivne atribute - obuhvaćene nazivom životnih stilova – koje formira u ranom djetinjstvu, osoba nastoji da izađe na kraj sa različitim razvojnim zadacima i životnim izazovima. Drugačije rečeno, životni stil je njen „tipični" obrazac ponašanja i reagovanja u širokom nizu situacija (Stoltz, Wolff, Monroe, Farris, & Mazahreh, 2012).

Mosek i Di Pjetro (2006, prema McCarty, & Christian, 2020) ističu da je, usljed ovakvog određenja pojma životnog stila u klasičnoj adlerijanskoj psihologiji, ovaj pojam se donekle može izjednačiti sa ličnošću osobe. Kao što je već rečeno, svaki životni stil je jedinstven i predstavlja jedinstvo misli, ponašanja i emocije osobe (McCarty, & Christian, 2020). Ono što je zanimljivo jeste da su ove Adlerove ideje kasnije iskorišćene i u drugim područjima ličnosti, van kliničke i psihologije ličnosti pa je tako Sevikas (2011, prema Stoltz, et al., 2012) pokušao da poveže životne stilove i teme sa procesima razvoja karijere i sposobnosti adaptacije na eventualne promjene u zanimanju.

Osobine ličnosti su „dimenzije individualnih razlika koje se odnose na tendenciju osobe da ispoljava konzistentne obrasce misli, osjećanja i radnji" (McCrae, & Costa, 1985: 124). One su relativno trajne dispozicije, tj. iako mogućnost njihovog mijenjanja postoji i u odraslom dobu, iako teže da se odupiru svim eventualnim promjenama. Jedna od najcitiranijih definicija ličnosti je Olportova. Prema Olportu „ličnost je dinamička organizacija unutar individue onih psihofizičkih sistema koji determinišu njegovo karakteristično prilagođavanje okruženju" (Allport, 1937, prema Smederevac i Mitrović, 2006: 314).

Možda najpoznatiji moderni model osobina ličnosti jeste model Velikih pet, koji je nastao na osnovu leksičkih studija engleskog jezika, tj. izdvajanja i ocjenjivanja niza izraza koje se koriste da opišu lične osobine i kvalitete osoba, te podvrgavanja ocjena faktorskoj analizi. Na osnovu faktorske analize, izdvojeno je pet bazičnih i robustnih faktora ličnosti, koji su sa uspjehom reprodukovani u mnogobrojnim trans-kulturološkim studijama (John, & Srivastava, 1999). Ovih pet faktora su nazvani: neuroticizam, ekstraverzija, saradljivost, savjesnost, otvorenost ka iskustvu (Golberg 1992; John, & Srivastava, 1999; McCrae, & Costa, 1985).

Individualne razlike u nivou školskog postignuća tj. akademskog uspjeha, oduvijek su bile u centru pažnje pedagoški orijentisanih psihologa, koje je interesovalo porijeklo ovih razlika. Shvatanje uzroka akademskog uspjeha ili neuspjeha bi imalo dalekosežne posljedice na pedagošku praksu i obrazovanje, poput identifikacije pouzdanih prediktora na osnovu kojih možemo zaključiti koji učenik će imati dobru, a koji nezadovoljavajuću performansu (O'Connor, & Paunonen, 2007). Identifikovanje ovih prediktora je utoliko značajnije ukoliko uzmemo u obzir neke od problema modernog obrazovanja, kao što je relativno veliki procenat đaka i studenata koji prekidaju svoje obrazovanje, ali i snižavanje nivoa akademskog znanja i kompetencije (Tok, & Morali, 2009).

Rezultati različitih empirijskih studija pokazuju da, iako intelektualne sposobnosti jesu značajan pojedinačni prediktor akademskog uspjeha, ogroman uticaj na isti vrše i različite osobine ličnosti, kvalitet i jačina motivacije, ali i opšti nivo mentalnog zdravlja i psihološkog blagostanja učenika. Naravno, jedno od pitanja koje se neminovno postavlja u ovim studijama jeste način operacionalizacije školskog uspjeha. Različite studije na izrazito raznovrsne načine operacionalizuju ovu varijablu, od prosječne ocjene, postignuća na standardizovanim testovima znanja, procjena uspješnosti od strane nastavnika ili nezavisnih posmatrača, uspjeha na školskim takmičenjima i vannastavnim aktivnostima, itd. (Štula, 2007, prema Letić i Lungulov, 2016). Kao kompromisno rješenje javlja se procjena akademske uspješnosti korišćenjem više kriterijuma istovremeno, što nam daje najcjelovitiju i najobjektivniju sliku (Feldhusen, & Jarwan, 2000, prema Letić i Lungulov, 2016).

Osobine ličnosti utiču na školski uspjeh na dva osnovna načina. Prije svega, svaka osobina podrazumijeva bihevioralne tendencije, odnosno sklonost ka izvođenju različitih oblika ponašanja. Mnogi od datih oblika ponašanja, kao što su istrajnost, motivisanost, dosljednost, asertivnost, socijabilnost, itd., su pozitivni u kontekstu obrazovanja i omogućavaju da student lakše ostvari svoje ciljeve i bude prepoznat zbog svojih uspjeha (Paunonen, Rush, & King, 1994, prema O'Connor, & Paunonen, 2007). Sa druge strane, ako kognitivne sposobnosti predviđaju da li će osoba moći da izvede određene stvari i postupke, osobine ličnosti predviđaju da li će biti i motivisana da ih uradi, tj. kakve ciljeve će odabrati i u kom maniru će nastojati da ih ostvari (Furnham, & Chamorro-Premuzic, 2004).

TEORIJSKI DIO

Termin „ličnost", koji se koristi da se označi jedinstvo različitih crta ličnosti, srećemo kako u stručnom tako i u laičkom govoru. Za laike, ličnost najčešće podrazumijeva karakterističan način ponašanja osobe u različitim situacijama, odnosno konzistentnost koja odražava trajne dispozicije pojedinca. Ovaj termin ćemo takođe čuti u okviru procjene životne uspješnosti različitih osoba („on je ostvarena ličnost"), kao izvor utiska koji osoba ostavlja na druge („on je blaga, prijatna ličnost"), itd. Onaj element koji je zajednički većini laičkih upotreba ovog termina jeste vrednovanje, evaluacija ličnosti u cjelini kao trajnog kvaliteta osobe koji se ispoljava u njenom ponašanju i odnosima sa drugima. U svakodnevnim interakcijama, „ličnost" nije vrijednosno neutralan termin i ljude svrstavamo u „dobre" i „loše" (Smederevac i Mitrović, 2006).

U naučnom smislu, termin „ličnost" i izdvajanje ključnih osobina ličnosti su značajni upravo zbog njihove povezanosti sa ponašanjem. Tačnije, na osnovu dobrog poznavanja individualnih dispozicija osobe možemo predvidjeti njeno ponašanje u različitim socijalnim situacijama (iako ne sa visokim stepenom sigurnosti) i objasniti zašto osobe pod istim sredinskim okolnostima često ispoljavaju drastično različite oblike ponašanja (Winter, & Barenbaum, 2008). Ipak, neophodno je napomenuti da se mnoge lične dispozicije ne ispoljavaju u ponašanju usljed različitih socijalnih i fizičkih ograničenja slobodi djelovanja osobe. Možda najpoznatiji i najuticajniji model klasifikacije osobina ličnosti jeste model velikih pet dimenzija ličnosti (engl. Big Five Model) (Golberg, 1990).

Osnovna ideja koja leži u osnovu modela velikih pet i mnogih drugih srodnih modela ličnosti jeste da se ogroman broj ličnih dispozicija, navika i konzistencija u ponašanju može objasniti, tačnije svesti na ograničen broj „bazičnih" dimenzija ličnosti, čime dobijamo relativno jasan, jednostavan i pregledan model osobina ličnosti koji se dalje može koristiti u opisu, objašnjenju i predviđanju ljudskog ponašanja (Roberts, Kuncel, Shiner, Caspi & Goldberg, 2007). Da bi dimenzija ličnosti bila označena kao „bazična", ona mora biti jasno nezavisna u odnosu na kognitivne sposobnosti, vremenski stabilna i invarijantna, odnosno uspješno replikovana u istraživanjima sprovedenim na uzorcima različitog pola, starosti, nacionalne kulture, itd. Model Velikih pet osobina ličnosti izdvaja ekstraverziju, savjesnost, prijatnost, neuroticizam i otvorenost prema iskustvu kao univerzalnih pet dimenzija ličnosti.

Ekstraverzija-introverzija je jedna od dimenzija ličnosti koja je replicirana u praktično svim modelima (PEN, 16PF, model velikih pet), što je opravdano ukoliko se uzima u obzir da je ova dimenzija povezana osnovnim odlikama temperamenta, odnosno toplinom emocionalne ekspresije i preferiranim nivoom stimulacije (Roberts, et al., 2007). Klasični primjeri ekstraverta su osobe koje su emocionalno tople, socijabilne, preferiraju da održavaju širok krug prijatelja i poznanika, teži uzbuđenjima, teško podnose dosadu i nedostatak spoljašnjih dešavanja, te često impulsivno postupaju. Po svom temperamentu su vedri, optimistični, nestrpljivi (John, & Srivastava, 1999).

Na drugoj strani kontinuuma nalaze se osobe koje bismo označili kao introverte, koje karakteriše emocionalna hladnoća, preferiranje manjeg broja socijalnih kontakata, zatvorenost i povučenost u komunikaciji sa drugima, preferiranje solo aktivnosti (čitanje, crtanje, šetanje, itd.), preferiranje poznatih situacija i osoba. Ovakve osobe su sklone rigidnoj kontroli izražavanja osjećanja, introspekciji, pesimizmu, okupljenosti unutrašnjim senzacijama i sadržajima (Larsen i Buss, 2008).

Što se tiče *prijatnosti* (često prevođene i kao saradljivost), ona se odnosi na stepen socijalizovanosti osobe, odnosno u kojoj mjeri je u stanju da slijedi društvena pravila i uzima u obzir prava i dobrobit drugih ljudi (Roberts, et al., 2007). Tako na jednom kraju ove dimenzije srećemo osobe koje su kooperativne, uviđajne i empatične, osjetljive na socijalnu nepravdu, otvorene i pune povjerenja prema drugima, a na drugom hladne, antagonističke, nepovjerljive, cinične i egoistične osobe koje imaju problema u održavanju toplih odnosa sa drugima (Smederevac i Mitrović, 2006; Larsen i Buss, 2008).

Osobina *savjesnost* se odnosi na stepen uspješnosti tolerancije frustracije, perzistentnost u naporima zarad ostvarenja odabranih ciljeva, mogućnost dosljednog planiranja i izvođenja napora koji služe dugoročnim interesima osobe (John, & Srivastava, 1999; Larsen i Buss, 2008). Na jednom kraju dimenzije nalaze se osobe koje opisujemo kao uredne, pažljive, metodične, precizne, posvećene svojim ciljevima istrajne, itd., a na drugom one koje su impulsivne, neorganizovane, neposvećene, neodlučne, slabo tolerišu frustraciju, itd. (Roccas, Sagiv, Schwartz, & Knafo, 2002).

Važno je napomenuti da je savjesnost osobina ličnosti petofaktorskog modela koja je najkonzistentniji prediktor školskog uspjeha i radne performanse, budući da u sebi sadrži mnoge uže osobine ličnosti i navike koje su nužen za uspjeh u ovakvom socijalnom miljeu.

Emocionalna stabilnost, često imenovana i po drugom polu dimenzije kao neurotičnost, je dimenzija koja je takođe element većine modela ličnosti (slično ekstraverziji) i takođe se odnosi na neke od fundamentalnih odlika temperamenta, odnosno na stepen reaktivnosti nervnog sistema, emocionalnu stabilnost, staloženost, sposobnost funkcionisanja pod pritiskom, stepen i učestalost doživljavanja negativnih emocija, impulsivnost i hostilnost, itd. (John, & Srivastava, 1999; Smederevac i Mitrović, 2006). Povišen neuroticizam upućuje na visok generalni nivo anksioznosti, burno reagovanje na sitnije teškoće i izazove, teškoće u regulaciji i podnošenju negativnih emocija koje često mogu voditi u druge patološke oblike ponašanja kao pokušaje rasterećenja (konzumiranje alkohola, lijekova, duvana, samopovređivanje, itd.), ispoljava rigidne i defanzivne obrasce razmišljanja i ponašanja, česte prolazi kroz povremene epizode panike ili depresivnosti, itd. (Roccas, et al., 2002). Na drugom kraju dimenzije nalaze se mirne i emocionalno stabilne osobe, koje se bez teškoća nose za životnim problemima, izazovima i stresom; emocionalno stresni događaji, čak i kada ih izbace iz ravnoteže, nemaju dugoročan efekat, već se ove osobe brzo vraćaju u svoje bazično stanje smirenosti (Larsen i Buss, 2008).

Otvorenost ka iskustvu, imenovana i kao kultura u mnogim petofaktorskim modelima ličnosti, se odnosi na stepen otvorenosti prema novim idejama, doživljajima, estetskim i čulnim senzacijama, snazi imaginacije, senzitivnosti, osjećanja, radoznalosti i dubine interesovanja (John, & Srivastava, 1999). Visok stepen otvorenosti ka iskustvu podrazumijeva sklonost ka brzom prihvatanju novih ideja i mišljenja, često i nekritično oduševljavanje istima, nekonvencionalnost, neobaziranje na društvene norme, traganje za novim senzacijama i iskustvima, umjetničke sklonosti i, u nekim istraživanjima, liberalnije političke stavove (Smederevac i Mitrović, 2006). Osobe koje ispoljavaju nizak stepen otvorenosti ka iskustvu su rigidne, preferiraju poznate senzacije, sklone su konzervativnijim stavovima, imaju uska i plitka interesovanja, teško se oduševljavaju estetskim senzacijama i iskustvima, obično nemaju umjetničkih preferencija i interesovanja, itd., a mnogi autori ovom spisku osobina dodaju i sklonosti poštovanju autoritetu, konformiranju društvenom pritisku, nekreativnosti i neoriginalnosti, siromaštvo imaginacije, itd. (Larsen i Buss, 2008).

Jedan od problematičnih aspekata pojma „životnog stila" jeste u mnogobrojnim načinima definisanja istog, pa čak i odbijanja da se isti precizno definiše u mnogim empirijskim studijama. U nekim studijama se pod stilom života misli na način na koji pojedinac želi da živi svoj život ili smatra da njegov život treba da izgleda, što ovaj pojam približava pojmu načina života (engl. way of life) (Pulkkinen, & Kokko, 2000; prema Jansen, 2007). Sa druge strane, u mnogim medicinskim i zdravstvenim studijama se pod stilom života misli na zbir različitih ponašanja i uticaja koji doprinose zdravlju ili bolesti pojedinca, kao što je stepen fizičke aktivnosti i vježbe, način prehrane, konzumiranje alkohola i nikotina, stepen svakodnevne izloženosti stresu, itd. (Alegria-Torres, Baccarelli, & Bollati, 2011).

Možemo razlikovati četiri nivoa definisanja životnog stila prema opštosti: 1) globalni – npr. kada se govori o opštim promjenama načina života u industrijalizovanim i globalizovanim društvima, promjenama koje su uslovljene informacionim i tehnološkim pomacima, 2) strukturalni ili nacionalni nivo – u smislu razlika u stilu života i vrijednostima između različitih kultura, npr. kolektivistički orijentisanih spram individualističkih, 3) grupni ili subkulturni nivo – što je domen socijalne psihologije i sociologije, u smislu grupacija i njihovih normi i oblika ponašanja koje članovi preuzimaju, 4) individualni nivo – koji je i u fokusu ove studije (Jansen, 2007).

U individualnom smislu, stil života se može posmatrati kao tipična manifestacija našeg selfa ili osjećaja identiteta, koja je oblikovana grupnim pritiscima, identifikacijama sa svijetom i socijalnim ulogama oko sebe, socio-ekonomskim okolnostima, te različitim medijskim uticajima. Stoga bi stil života predstavljao spolja vidljivu manifestaciju identiteta, izraz pojedinčeve jedinstvenosti na osnovu kojih se razlikuje od svih drugih osoba. Stil života se održava i manifestuje kroz različita ponašanja, ali se on ne može izjednačiti sa njima (npr. potrošačkim oblicima ponašanja kao bitnoj odrednici modernog kolektivnog identiteta), budući da je riječ o široj i trajnijoj dispoziciji (Jensen, 2007). Stil je izraz identiteta, odnosno način materijalne realizacije identiteta kroz konkretne oblike ponašanja i interakcija u svakodnevnom životu koji su za osobu obojene psihološkim značenjem i simbolizmom (kao što npr. korišćenje recikliranih proizvoda za nekoga može biti bitan izraz svog identiteta usmjerenog na ekološko očuvanje prirode) (Wilska, 2002; prema Jensen, 2007). Gidens (1991: 81 prema Jensen, 2007) definiše stil života kao: „manje ili više integrisan skup aktivnosti koje osoba izvodi i podržava ne samo zato što te aktivnosti zadovoljavaju njene neposredne interese i potrebe, već zato što daju materijalni oblik njenom narativu o ličnom identitetu".

Bitni aspekti gore navedene definicije su upravo relativna nezavisnost stila od neposrednih potreba pojedinca, budući da ova ponašanja služe jednoj višoj i složenijoj svrsi – izgradnji ličnog narativa, darovanja smisaonosti životu u svjetlu izgrađenog identiteta, ali i dinamičnost stila života. Baš kao što je identitet relativno dinamičan pojam, tako i promjene u stilu života mogu odražavati ključne pomake i transformacije u našem doživljaju sebe (Chaney, 1996, prema Jansen, 2007). Što je društvo složenije, razvijenije, slobodnije i bogatije, to je pojedincu na raspolaganju više izbora putem kojih može da konkretizuje i simbolizuje svoj identitet - različitim zanimanjima, stilovima oblačenja, vrstama muzike, itd. U potrošačkom društvu, ne samo posjedovanje već i (naročito) javna, vidljiva konzumacija različitih vrsta proizvoda i usluga su bitno obilježje stila života i ličnog identiteta (poput odlaska na koncert omiljene grupe, vožnje skupe i prestižne marke automobila) (Jansen, 2007). Stoga se stil života može na nešto jednostavniji način definisati i kao tipični način života pojedinca ili socijalne grupe (Alegria-Torres, et al., 2011). Sam pojam stila života se u psihološkoj nauci po prvi put sreće u radovima uticajnog psihoanalitičara Alfreda Adlera (Ansbacher, & Ansbacher, 1956, prema Stoltz, et al., 2012) i njegovoj individualnoj psihologiji. Adler (1956, prema Hol i Lindzi, 1983) ljudsko ponašanje objašnjava putem teleoloških principa, odnosno kao svrsishodno, kreativno i ka cilju usmjereno, a osnovni pokretač osoba jeste da kroz svoje ciljeve pronađu mjesto u životu i osmisle ga. Prema Adleru (1956, prema Hol i Lindzi, 1983) ljudi su prvenstveno i socijalna bića, tačnije ugrađeni su u svoje socijalno okruženje, imaju želje i potrebe da pripadaju društvu i da ih drugi vole, cijene i poštuju. Osnovni motivacioni pokretač koji je u osnovi ljudskog ponašanja je stoga težnja da se osoba pomjeri od percipirane situacije nedostatka ili manjka („minusa") ka situaciji obilja („plusa"), odnosno od situacije inferiornosti ka situaciji superiornosti, putem ciljeva koje bira i pronalazi smisaonim.

Iako je Adler u svojim radovima često koristio pojam stila života krajnje neprecizno i varijabilno, Torn (1955, prema Gentry, Winner, Sigelman, & Phillips, 1980) na osnovu pregleda i sinteze Adlerovih radova navodi da se stil života može odrediti kao distinktivna šema koju osoba steče rano u životu, i koja predstavlja organizaciju njenih dispozicija, interesovanja i stavova, usmjerenu ka ostvarenju onih ciljeva koje osoba smatra značajnim, odnosno, stil života je svojevrsni funkcionalni totalitet našeg stava prema životu, načina postavljanja prema njemu i onoga što želimo da ostvarimo u istom.

Modernije i cjelovitije određene stila života bi glasilo da se radi o ličnog meta-narativu, odnosno našoj životnoj priči koja odražava stečena uvjerenja i kognitivne šema, a ovaj narativ se počinje formirati već u prvim godinama života i odupire se promjenama, iako one nisu nemoguće (Watts, 2015).

Pojam vrijednosti je usko povezan sa stilom života, odnosno stil života se može interpretirati kao pokušaj osobe da kroz različite oblike ponašanja ostvari svoje terminalne ciljeve koje su dio sistema vrijednosti u koji osoba vjeruje i želi da ostvari. Pod „vrijednostima" se podrazumijevaju krajnji ili terminalni ciljevi koje osoba želi da ostvari, koje smatra „idealnim" stanjima poput povezanosti sa drugima, sticanja novih saznanja, materijalne moći i bogatstva, jedinstva sa božanstvenim bićem, itd. Da bi se ostvarili ovi krajnji ciljevi osoba sebi postavlja niz instrumentalnih ciljeva kao „stepenika" na putu ka ostvarenju vrijednosti, kao što su npr. upis prestižnog fakulteta da bi se lakše ostvarili moć i prestiž u svojoj odabranoj struci, prihvatanje osobi neprivlačnog, ali dobro plaćenog posla da bi mogla voditi udoban život, i slično. Dakle, vrijednosni sistem i vrijednosna orijentacija se manifestuju u stilu života pojedinca, koji je njen karakterističan obrazac ponašanja, provođenja slobodnog vremena i kvaliteta interpersonalnih odnosa čiji je cilj ostvarenje ovih terminalnih ciljeva (Luković i Čizmić, 2012).

I na kraju, mnogi istraživači se susreću sa značajnim teškoćama u procesu operacionalizacije i definisanja učeničkog uspjeha. Ovaj termin se kroz različite empirijske studije tumači i koristi na tako raznovrsne načine da se zapravo odnosi na čitav niz ishoda koje posmatramo i očekujemo u procesu obrazavanja. Termin „akademski uspjeh" je nešto uži utoliko što bi termin „akademski" trebalo da ograniči ishode na one povezane sa samim procesom obrazovanja, tj. sticanje novih znanja i vještina, njihovu primjenu, ostvarene formalne ocjene, a ne na šire procese kao što su promjena ličnosti učenika ili podsticanje razvoja intelektualnih sposobnosti (O'Connor, & Paunonen, 2007). Ono što je bez sumnje izvjesno jeste da u praktičnom radu i svakodnevnom životu srećemo drastično različite laičke definicije „uspjeha", koje su u velikoj mjeri uslovljene položajem same osobe u obrazovnom procesu i očekivanjima sa kojima ulazi u isti. Tako bi npr. za mnoge profesore najznačajniji indikator uspjeha bio kvalitet samih predavanja i stepen u kome ista odražavaju njihov (visok) stepen stručnog znanja; za studente/učenike bi to bio stepen usvojenih znanja i vještina, te njihova primjenjivost u praktičnom radu nakon nalaženja zaposlenja, a za administratore prosjek ocjena, broj upisanih studenata, itd. Ono što je izvjesno jeste da svaka od ovih ličnih „definicija" obuhvata po jedan aspekt složenog obrazovnog procesa, posmatranog iz različitih perspektiva (York, Gibson, & Rankin, 2015). U mnogim istraživanjima se, naročito onim gdje je akademski uspjeh samo jedna u nizu ispitanih varijabli, on svede na prosječnu ocjenu (tj. prosjek ostvarenih ocjena) kao brzu procjenu akademskog uspjeha (Cachia, Lynam, & Stock, 2018). Naravno, bitno je napomenuti da je prosječna ocjena samo grub indikator akademskog uspjeha i da ne mora nužno biti snažno povezana sa istim, npr. u slučajevima gdje su visoke ocjene rezultat mehaničkog učenja napamet, a ne istinske i uspješne primjene naučenog.

Drugo pitanje koje se često postavlja jeste koje su determinante akademskog uspjeha, odnosno koji faktori povećavaju šansu za akademski uspjeh ili neuspjeh pojedinačnih učenika. Ovi faktori se ugrubo dijele na kognitivne, odnosno one koji se odnose na sposobnosti, znanja i kompetencije studenata, te nekognitivne, koji potpadaju pod domen motivacije, osobina ličnosti i socijalnog okruženja (Eisenberg, Golberstein, & Hunt, 2009).

METODOLOŠKI DIO

Problem i cilj istraživanja

Problem ovog istraživanja se odnosi na analizu relacija između osobina ličnosti, stilova života i akademskog uspjeha studenata. U istraživanju su uključene osobine ličnosti modela Velikih pet, kao jednog od najuticajnijih modela individualnih razlika, koji je u nizu ranijih studija povezan i sa akademskim i sa kasnijim profesionalnim uspjehom. Dodatna varijabla priključena osobinama ličnosti jeste pojam „životnog stila“, kao izrazito široke i kompozitne varijable koja u sebi objedinjuje tipične obrasce ponašanja, vrijednosne orijentacije i kognitivna uvjerenja osobe. Osnovna ideja istraživanja jeste da određeni profili studenata – koji ispoljavaju adaptivne osobine ličnosti i životni stil fokusiran na ostvarenje uspjeha i dalje obrazovanje – postižu veći stepen akademske uspješnosti, na šta ih podstiču upravo ove dispozicije. Osnovni cilj istraživanja odnosi se na analizu postojanja i pravac relacija između osobina ličnosti, životnih stilova i akademske uspješnosti studenata, te da li osobine ličnosti i stilovi života predstavljaju prediktore akademskoj uspješnosti studenata.

Hipoteze istraživanja

U skladu sa gore formulisanim problemom i ciljem istraživanja te na osnovu teorijskog uporišta postavljene su sljedeće hipoteze:

- H1. Postoji statistički značajna povezanost između osobina ličnosti i akademske uspješnosti.
  - H1.1. Savjesnost statistički značajno i pozitivno korelira sa akademskom uspješnošću.
    Od svih faktora modela Velikih pet, savjesnost je najkonzistentnije povezana sa akademskom uspješnošću u visokom obrazovanju. Više empirijskih studija je dokazalo pozitivnu povezanost između visokih skorova na ovoj osobini i niza indikatora akademske uspješnosti. Savjesnost visoko i pozitivno korelira ne samo sa opštim prosjekom postignutih ocjena na studiju, već i sa nizom drugih pokazatelja, poput stepena učešća u studentskim projektima, rangiranjem studenata od strane profesora i stepena aktivnosti na predavanjima (Furnham, Chamorro-Premuzic, & McDougall, 2003; Chamorro-Premuzic & Furnham, 2003; Trapmann, Hell, Hirn, & Schuler, 2007; Rimfeld, Kovas, Dale, & Plomin, 2016; Hakimi, Hejazi, & Lavasani, 2011; Zhang 2003; Komarraju, Karau, Schmeck, & Avdic, 2011).
  - H1.2. Otvorenost ka iskustvu ne korelira statistički značajno sa akademskim uspjehom.
    Nulta podhipoteza je postavljena usled oprečnih rezultata empirijskih studija koje su se bavile odnosom između otvorenosti ka iskustvu i akademske uspješnosti studenata. Sa jedne strane, neke studije pokazuju postojanje pozitivne povezanosti između otvorenosti ka iskustvu i različitih aspekata akademske performanse, od opšteg prosjeka ocjena do učešća u različitim studentskim aktivnostima (Zhang, 2003; Komarraju, et al., 2011).

Međutim, ovi rezultati nisu bili dosljedno replicirani u drugim studijama, koje su pronalazile odsustvo značajnog, bilo pozitivnog, bilo negativnog, odnosa između otvorenosti ka iskustvu i akademskog uspjeha.

- H1.3. Ekstraverzija ne korelira statistički značajno sa akademskim uspjehom.
  Slično otvorenosti ka iskustvu, i ekstraverzija ne pokazuje dosljedan i jednoznačan obrazac korelacija sa školskim uspjehom. U određenom broju studija ekstraverzija je negativno korelirala sa opštim prosjekom ocjena i uspješnošću u predmetima povezanim sa prirodnim naukama (Furnham, et al., 2003, Chamorro-Premuzic, & Furnham, 2004; Hakimi, et al, 2011; Komarraju, et al., 2011), što su autori datih studija objasnili većom usmjerenošću ekstravertnijih osoba na sticanje novih socijalnih odnosa i iskustava negoli na učenje i sticanje znanja, čemu su introverti u ovoj interpretaciji skloniji, jer preferiraju solo mentalne aktivnosti poput učenja. Međutim, druge studije pokazuju nedostatak značajne korelacije između ekstraverzije i uspjeha, ili pozitivnu korelaciju u slučaju nekih zanimanja kao što je menadžment (Trapmann, et al., 2007; Zhang, 2003).
- H1.4. Neuroticizam statistički značajno i negativno korelira sa akademskim uspjehom.
  Postoji kako teorijsko tako i empirijsko obrazloženje navedene hipoteze. Sa jedne strane, veliki broj empirijskih studija je utvrdio postojanje negativne povezanosti između neuroticizma i različitih pojedinačnih indikatora akademskog uspjeha (Furnham, et al., 2003; Chamorro-Premuzic, & Furnham, 2003). Naravno, u teorijskom smislu može se ponuditi objašnjenje da se emocionalno stabilni studenti daleko bolje nose sa različitim stresovima i izazovima koje studiranje nosi sa sobom. Dalje, anksioznost i strah koje emocionalno nestabilni studenti doživljavaju u većoj mjeri nego emocionalno stabilni često utiču na njihov nivo prisebnosti, koncentracije i performanse (Trapmann, et al., 2007; Zhang, 2003; Hakimi, et al., 2011; Komarraju, et al., 2011).
- H1.5. Ne postoji statistički značajna korelacija između saradljivosti i akademskog uspjeha.
  Od svih dimenzija modela Velikih pet, najmanje je istraživanja koje se bave proučavanjem povezanosti saradljivosti i akademskog uspjeha. U nekim studijama saradljivost je bila pozitivno povezana sa prosječnim ocjenama (Hakimi, et al., 2011; Komarraju, et al., 2011), a u drugim negativno (Zhang, 2003) ili korelacija nije bila statistički značajna. Moguće je da se do ovakvih rezultata došlo usljed različitog konteksta: npr. saradljivost vodi ka boljem školskom uspjehu samo kada socijalna atmosfera i norme društvenih grupa podstiču akademsko postignuće i zalaganje, ne i kada su negativno nastrojene prema ovom domenu.

- H2. Ne postoji statistički značajna korelacija između životnih stilova i akademske uspješnosti.
- H3. Životni stilovi (porodično-sentimentalni, utilitarni, egoistički, orijentisan na popularnost, orijentisan na moć, prometejski aktivizam, altruistička, saznajna i religijsko-tradicionalna orijentacija) ne predstavljaju statistički značajne prediktore akademske uspješnosti.

Uzorak istraživanja

Uzorak istraživanja se sastojao od 211 ispitanika, pretežno studenata Univerziteta u Istočnom Sarajevu anketiranih putem onlajn upitnika. Većinu uzorka čine ispitanici ženskog pola, njih 63.98%. Starost ispitanika se kreće od 18 do 30 godina, uz prosječnu starost od 23 godine, SD=5.01. Zarad kasnije obrade podataka, ispitanici su prema starosti podijeljeni u tri grupe približno podjednake veličine: ispitanike starosti od 18 do 21 godine

(36.49%), one starosti od 22 do 25 godina (31.75%), te one starosti od 26 do 30 godina (31.75%). Većina ispitanika su studenti treće godine studija (19.43%), praćeni sa studentima master studija (18.96%), dok je najmanje studenata četvrte godine studija (9.48%). Ispitanicima su postavljena pitanja koja se odnose i na njihovo studiranje, poput dužine studiranja i ostvarene prosječne ocjene na studijama. Tako se ostvarena prosječna ocjena na studijama kreće između 6 i 10, uz prosjek od 8.04, SD=0.85. Dužina studiranja se kreće od 1 do 10 godina, uz prosječnu dužinu od M=4.08, SD=1.82. Velika većina ispitanika, tačnije njih 94.32%, navodi da studiraju fakultet koji su željeli i odabrali, dok svega 12 ispitanika tvrdi suprotno. Ukupno 60 ili 28.44% ispitanika navodi da su u nekom momentu studiranja obnovili godinu.

Mjerni instrumenti

Osobine ličnosti su mjerene Upitnikom za ispitivanje modela ličnosti Velikih pet (Goldberg, 1992). Korišćena je verzija od 50 ajtema koji mjere pet osobina ličnosti (ektraverzija, saradljivost, savjesnost, emocionalna stabilnost i otvorenost ka iskustvu). Radi se o petostepenoj skali Likertovog tipa, gdje ispitanici na skali od jedan do pet odgovaraju koliko se postavljeno pitanje odnosi na njih. Koeficijenti pouzdanosti subskala izraženi putem Kronbah alfa koeficijenta dobijeni u ovom istraživanju su: ekstraverzija - 0.85, saradljivost - 0.73, savjesnost - 0.75, neuroticizam - 0.86, otvorenost ka iskustvu - 0.69.

Za mjerenje stilova života korišćena je modifikovana verzija Olport-Vernon-Lindzijeve skale vrijednosti, koja je konstruisana kao petostepena skala Likertovog tipa, primijenjene u doktorskoj disertaciji Kneževićeve (2016). Skala mjeri deset životnih stilova: utilitarni, porodično-sentimentalni, egoistički, orijentisan na popularnost, na moć, prometejski aktivizam, altruistička orijentacija, saznajna i religijsko-tradicionalna orijentacija. Za potrebe ovog istraživanja, radi boljih metrijskih karakteristika, svaka od tvrdnji će biti razložena na više stavki. Tako će npr. stavka „Upoznati osobu koju volite i koja Vas voli, zajedno sa njom osnovati porodicu i potpuno joj se posvetiti. Naći smisao života u porodici“ biti razložena na stavke poput „Zasnovati porodicu sa voljenom osobom.“, „Posvetiti se porodici i naći smisao života u njoj“, itd. Kronbah alfa koeficijenti pouzdanosti životnih stilova dobijeni u ovom istraživanju su: porodično-sentimentalni stil - 0.82, altruistički stil - 0.74, saznajni stil - 0.84, utilitarni stil - 0.72, stil orijentisan na popularnost - 0.92, egoistički stil - 0.83, prometejski aktivizam - 0.72, hedonistički stil - 0.47, religijsko-tradicionalna orijentacija - 0.95, orijentacija na moć - 0.84. Koeficijenti pouzdanosti svih subskala, osim subskale hedonistički stil bili su zadovoljavajući. Usljed izrazito niskog koeficijenta pouzdanosti koji nije mogao biti popravljen eventualnim izbacivanjem stavki subskala hedonističkog stila nije uključena u dalju obradu.

Akademska uspješnost je ispitana setom pitanja koja se odnose na prosjek stečen za vrijeme studija i dužinu studiranja.

REZULTATI I DISKUSIJA

U Tabeli 1 se može vidjeti prikaz osnovnih parametara korištenih mjera. Opisni pokazatelji prikazani u Tabeli 1 ukazuju na raspodjelu vrijednosti neprekidnih promjenjivih.

Rezultati sprovedenih Kolmogorov-Smirnov testova pokazuje da distribucija skorova ispitanika na svim subskalama upitnika stilova života, kao i na osobinama ličnosti modela Velikih pet, odstupa od oblika normalne raspodjele na šta ukazuju i vrijednosti Kolmogorov-Smirnov testa (*K-S, p<.001, p<.005*). Smjer i priroda ovih odstupanja i asimetričnosti se može vidjeti iz vrijednosti skjunisa i kurtozisa navedenih u Tabeli 1.

Analizirajući relacije između osobina ličnosti Velikih pet i akademskog uspjeha izraženog kroz prosječne ocjene ostvarene na studiju, pošlo se do pretpostavke da postoji povezanost između osobina ličnosti obuhvaćenih modelom Velikih pet i akademskog uspjeha. Budući da distribucija skorova ispitanika na dimenzijama modela Velikih pet odstupa od normalne krive za provjeru ove hipoteze i njenih podhipoteza korišćen je Spirmanov koeficijent korelacije kao neparametrijska mjera. Izračunate korelacije prikazane su u Tabeli 2.

Tabela 1. Deskriptivni parametri varijabli korišćenih u istraživanju
Table 1. Descriptive parameters of the variables used in the research

Varijable	*Min*	*Max*	*M*	*SD*	*Sk*	*Ku*	*K-S*	*p*
Stilovi života								
Porodično-sentimentalni stil	5.00	20.00	18.63	2.30	-2.55	8.47	.30	.000***
Altruistički stil	7.00	15.00	12.88	1.88	-.88	.12	.19	.000***
Saznajni stil	5.00	25.00	19.27	4.39	-.56	-.11	.10	.000***
Utilitarni stil	6.00	15.00	11.97	2.38	-.31	-.73	.14	.000***
Stil orijentisan na popularnost	3.00	15.00	7.46	3.97	.61	-.84	.14	.000***
Egoistička orijentacija	10.00	20.00	14.89	2.14	.37	-.11	.12	.000***
Prometejski aktivizam	8.00	20.00	16.66	2.66	-.61	-.16	.14	.000***
Religijsko-tradicionalna orijentacija	5.00	25.00	19.44	5.64	-.90	.01	.16	.000***
Orijentacija na moć	3.00	15.00	10.22	3.47	-.39	-.71	.09	.000***
Osobine ličnosti								
Ekstraverzija	15.00	50.00	34.95	7.89	-.29	-.44	.07	.001**
Saradljivost	25.00	50.00	40.84	5.50	-.36	-.56	.10	.000***
Savjesnost	16.00	50.00	38.28	6.23	-.66	.36	.10	.000***
Neuroticizam	11.00	45.00	27.79	8.33	.11	-.94	.08	.000***
Otvorenost ka iskustvu	23.00	46.00	37.26	4.42	-.38	-.37	.10	.000***

Napomene: Min – minimalna empirijska vrijednost; Max – maksimalna empirijska vrijednost; M – aritmetička sredina; SD – standardna devijacija; Sk – skjunis; Ku – kurtozis; K-S – Kolmogorov Smirnov test, ***p<.001, **p<.005

Tabela 2. Koeficijenti korelacije dimenzija ličnosti modela Velikih pet i akademskog uspjeha
Table 2. Correlation coefficients of the Big Five personality dimensions and academic success

	Ekstraverzija	**Saradljivost**	**Savjesnost**	**Neuroticizam**	**Otvorenost**
N	211	211	211	211	211
rho	.101	.132	.246**	-.105	.084

Napomena: ** p<.01

Na osnovu vrijednosti koeficijenata korelacije prikazanih u Tabeli 2 i testova njihove značajnosti može se zaključiti da od svih dimenzija ličnosti modela Velikih pet jedino savjesnost statistički značajno pozitivno korelira sa ostvarenim akademskim uspjehom izraženim kroz prosječnu ocjenu na studijama (*rho=.246*). Time je prva hipoteza djelimično potvrđena (tačnije njene podhipoteze H1.1, H1.2 i H1.3).

Savjesnost je dimenzija modela Velikih pet koja je u velikom broju istraživanja dosljedno povezana sa akademskim i poslovnim uspjehom, kao npr. u istraživanju Zhanga (2003). S obzirom na to da se ova osobina ličnosti odnosi na visok stepen samodiscipline, organizovanosti, dosljednosti i upornosti u ostvarenju svojih ciljeva, kao i na optimalan stepen razvijenosti tolerancije na frustraciju onda ne čudi i činjenica da je ona od velikoj značaja i u procesu studiranja. Za ostvarenje visoke prosječne ocjene na studijama od velikog su značaja uporan i kontinuiran rad, osjećaj za samodisciplinu i organizaciju sopstvenog vremena, ali i sposobnost podnošenja različitih frustracija zarad ostvarenja ciljeva koji se nalaze u potencijalno dalekoj budućnosti, poput završetka fakulteta, sticanja stručnog zvanja i nalaženja posla u struci. Ipak, teško je ponuditi jasan odgovor na pitanje zašto ostale osobine modela Velikih pet ne koreliraju statistički značajno sa prosječnom ocjenom na studijama kao mjerom akademskog uspjeha. Moguće je da je povezanost ovih dimenzija ličnosti sa uspjehom složenije prirode i da zavisi od socijalnog konteksta (recimo, vrste profesije za koju se osoba školuje) i drugih osobina ličnosti koje osoba posjeduje. Tako je recimo moguće zamisliti da otvorenost ka iskustvu značajno pozitivno korelira sa uspjehom na studijama u slučaju studiranja na smjerovima kao što su umjetnost, grafički dizajn, a negativno ili ne korelira uopšte sa uspjehom na „konvencionalnijim" smjerovima poput ekonomije i prava.

Analizirajući relacije između životnih stilova i akademskog uspjeha izraženog kroz prosječne ocjene ostvarene na studiju, pošlo se do pretpostavke da ne postoji statistički značajna povezanost između životnih stilova i akademskog uspjeha. Budući da distribucija životnih stilova u uzorku ispitanika takođe odstupa od normalne krive, ponovo je korišćen Spirmanov koeficijent korelacije. Rezultati su prikazani u Tabeli 3.

Tabela 3. Korelacije životnih stilova i akademskog uspjeha studenata
Table 3. Coefficients of correlation of lifestyles and academic success of students

	Porodično-sentimentalni stil	Altruistički	Saznajni	Utilitarni	Stil orijentisan na popularnost	Egoistička orijentacija	Prometejski aktivizam	Religijsko tradicionalna orijentacija	Orijentacija na moć
N	211	211	211	211	211	211	211	211	211
rho	.155*	.034	.167*	-.013	-.198**	.017	.149*	.026	-.127

Napomena: * p<.05, ** p<.01

Kako se može vidjeti iz Tabele 3, ukupno četiri stila života statistički značajno koreliraju sa ostvarenim akademskim uspjehom: porodično-sentimentalni stil (*rho=.155*), saznajni stil (*rho=0.167*), stil orijentisan na popularnost (*rho=-.198*) i prometejski aktivizam (*rho= .149*). Iako nijedna od navedenih korelacija nije visoka, one upućuju na nesumnjivo postojanje povezanosti između ovih konstrukta i ulogu koju stilovi života kao složeni sistemi vrijednosti, ciljeva, stavova i vjerovanja igraju u određivanju konačnih oblika ponašanja i ostvarenih rezultata unutar obrazovnog sistema. Ovim je i druga hipoteza djelimično potvrđena.

Iako nijedna od korelacija nije visoka, one svakako upućuju na postojanje značajnih veza između stilova života kao obrazaca ponašanja i vrijednosnih orijentacija sa jedne strane i akademskog uspjeha sa druge. Pozitivna korelacija saznajnog stila sa uspjehom na studijama je evidentna jer se ovaj životni stil odnosi na intelektualnu radoznalost, zainteresovanost za nauku i istraživački rad, te svoj puni izraz i nalazi upravo u akademskom i naučnom okruženju koje univerzitet pruža. Povezanost prometejskog aktivizma sa uspjehom se može objasniti putem obrazovanja za datu profesiju kao načina da se ostvare lične vrijednosti i ostvare željene društvene promjene, recimo radom u zdravstvenom sistemu, školskom, socijalnoj zaštiti i staranju i slično. Porodično-sentimentalni stil, koji je svakako visoko zastupljen u uzorku istraživanja, pozitivno korelira sa uspjehom na studijama možda upravo po osnovi sticanja profesije i budućeg zaposlenja koji se percipiraju kao neophodni koraci za zasnivanje sopstvene porodice i mogućnost finansijske brige o drugim članovima porodice, partnerima, a u konačnoj liniji i o svojoj djeci jednog dana. Stil usmjeren na popularnost je jedini koji značajno negativno korelira sa uspjehom na studijama. Moguće je da snažna usmjerenost na održavanje širokog kruga prijateljstava, na ostvarivanje slave i popularnosti u očima drugih, želja za privlačenjem pažnje, ometaju osobu u ostvarenju dugoročnih i konstruktivnijih ciljeva koji podrazumijevaju kratkoročne žrtve, kao što je npr. učenje zarad spremanja ispita. Kratkoročna orijentacija na popularnost, na socijalne kontakte i divljenje drugih potencijalno ometaju ovakve osobe u ostvarenju dugoročnih ciljeva putem snižene tolerancije na frustraciju i osjećaja unutrašnje praznine i dosade. Stoga je moguće zaključiti da su stilovi života usmjereni na pomaganje drugima i pripadnost kolektivu pozitivno povezani sa uspjehom na studijama, a oni usmjereni na kratkoročnu dobit i socijalnu popularnost negativno.

Da bi se provjerila treća hipoteza sprovedena je logistička regresija, postupak namijenjen predviđanju kategorijskih zavisnih varijabli, odnosno u ovom slučaju akademskog uspjeha izraženog kroz prosječnu ocjenu na studijama. Prije sprovođenja regresione analize izvršena je provjera zadovoljenja osnovnih pretpostavki za sprovođenje logističke regresije (veličina uzorka, multikolinearnost i autlajeri). Nakon toga je sprovedena binominalna logistička regresiona analiza u kojoj je akademski uspjeh bio kriterijska varijabla, a različiti stilovi života prediktorske varijable.

Omnibus test koeficijenata modela je statistički značajan ($\chi2=21.59$, $df=10$, $p=.02$), što upućuje na značajnost modela i njegovo podudaranje sa dobijenim podacima. Hosmerov test značajnosti nije statistički značajan ($\chi2=10.42$, $df=8$, $p=.23$) što takođe upućuje na adekvatnost modela. U slučaju logističke regresije da bi se zaključivalo o prediktivnoj moći modela koriste se dvije vrijednosti R kvadrata. Koksov R2 iznosi .10, a Nagelkereov .14, što upućuje na to da model u cjelini predviđa između 10% i 14% varijanse akademskog uspjeha. Navedeni procenat nije visok što sugeriše da na akademski uspjeh utiču i mnogi drugi faktori osim stilova života. Pregled značajnosti pojedinačnih prediktora dat je u Tabeli 4.

Tabela 4: Značajnost pojedinačnih prediktora modela
Table 4. Significance of individual model predictors

	β	**Standardna greška**	**Wald**	**df**	**p**
Porodično-sentimentalni stil	.11	.09	1.32	1	.25
Altruistički stil	.01	.11	.01	1	.92
Saznajni stil	.07	.04	2.98	1	.08
Utilitarni stil	.02	.08	.05	1	.83
Stil orijentisan na popularnost	-.14	.06	5.82	1	.02
Egoistička orijentacija	.03	.09	.08	1	.78
Prometejski aktivizam	.08	.07	1.27	1	.26
Religijsko-tradicionalna orijentacija	-.08	.06	1.81	1	.18
Orijentacija na moć	-.01	.03	.15	1	.70
Porodično-sentimentalni stil	-.00	.06	.00	1	.95

Napomene: β – vrijednost beta koeficijenta, Wald – vrijednost Valdovog indikatora, df – broj stepeni slobode, p – statistička značajnost prediktora

Od svih životnih stilova koji su uključeni u prediktivni model, samo je životni stil orijentisan na popularnost bio statistički značajan i negativan prediktor akademskog uspjeha. Ova varijabla značajno doprinosi predikcijskoj sposobnosti modela. Stoga se može reći da je četvrta hipoteza istraživanja većim dijelom potvrđena, jer većina životnih stilova nisu bili značajni prediktori akademske uspješnosti.

S obzirom na to da je model u cjelini bio statistički značajan i predviđao je između 10 i

14% ukupne varijanse akademskog uspjeha, može se reći da stilovi života daju relativno skroman, iako značajan, doprinos predikciji akademskog uspjeha i izvjesno je da su samo jedna u nizu varijabli koje doprinose uspjehu. Obuhvatniji model bi morao da uzme u obzir i mnoge osobine ličnosti osobe, njenu motivaciju, ali i odlike same sredine i kulture uopšteno (recimo, koliki značaj kultura uopšte daje obrazovanju i postignućima u toj oblasti). Od svih stilova života jedino je stil usmjeren na popularnost bio statistički značajan prediktor (β=-0.14). Ovakvi rezultati dodatno potvrđuju ideju da je pretjerana usmjerenost na socijalni život i popularnost u krugu poznanika faktor koji potencijalno dovodi do nižeg akademskog uspjeha, moguće usljed nedostatka vremena, gubitka zainteresovanosti za studiranje, gubitka prioriteta, i slično. Ipak, moguće je da je između stilova života i akademske uspješnosti postoje još složeniji odnosi nego što su utvrđeni ovim istraživanjem. Moguće je da određeni stilovi života dovode ka većoj sklonosti ka prekidu, napuštanju ili nenastavljanju obrazovanja u potrazi za životnim ciljevima drugačije vrste. Tako bi recimo utilitarni stil, usmjeren na materijalnu dobit, mogao biti povezan sa prekidom školovanja zarad ranijeg početka zaposlenja. Međutim, budući da je ovo istraživanje obuhvatilo samo osobe koje trenutno studiraju ovakva razmatranja nije bilo moguće potvrditi.

ZAKLJUČAK

Osnovni cilj ovog istraživanja bio je utvrđivanje da li osobine ličnosti i životni stilovi predstavljaju značajne faktore akademskog uspjeha. Iako su nivo inteligencije i različite sposobnosti značajni faktori akademskog uspjeha, uloga osobina ličnosti i širokog stila života osobe ne treba da budu zanemareni u proučavanju akademskog uspjeha. Od strukture ličnosti i stepena motivisanosti zavisi da li će osoba moći da istraje u aktivnostima koje dovode do ostvarenja uspjeha i da li će svoje sposobnosti znati da adekvatno primjeni. Studija se fokusirala na dvije široke grupe konstrukata kao potencijalnih faktora akademskog uspjeha: osobine ličnosti unutar modela Velikih pet i različite stilove života. Teorijski cilj istraživanja je ispunjen budući da nesumnjivo postoji povezanost između različitih životnih stilova kao specifičnih orijentacija osoba i stepena njihove akademske uspješnosti. Dobijene korelacije su niske i umjerene, što upućuje na neophodnost uključivanja drugih faktora u istraživanje koji bi pomogli u dodatnom rasvjetljavanju odnosa između ove dvije grupe varijabli. Praktične implikacije istraživanja su dvostruke prirode. Sa jedne strane, da bi studenti motivisali za bolji i kvalitetniji rad, neophodno je povezivati materijal i saznanja struke koje proučavaju sa njihovim širim životnim stavovima, vrijednostima i orijentacijama. Drugačije rečeno, gradivo koje uče i profesija kojoj teže moraju biti dio njihovih širih životnih stremljenja, poput orijentacije ka pomaganju drugima, očuvanju tradicije, društvenim reformama, itd. Sa druge strane, neophodno je podsticati usvajanje onih stavova i orijentacije koje znanje, profesionalni i naučni rad vide kao vrijedne same po sebi i poželjne ciljeve, kao što su altruistička ili saznajna orijentacija.

Neke od poteškoća u samom istraživanju prvenstveno se odnose na operacionalizovanje akademskog uspjeha kao prosječne ocjene ostvarene na studijama. Radi se o grubom indikatoru akademske uspješnosti, iako je korišćen i uvažavan od strane većine institucija. U budućim istraživanjima neophodno je operacionalizovati pojam akademske uspješnosti na složeniji način, tako da obuhvata različite dodatne dimenzije poput učešća u projektima, vannastavnim aktivnostima, dodatna stručna usavršavanja, itd. Druga zamjerka odnosi se na operacionalizaciju različitih stilova života, poput hedonističkog koji nije pokazao zadovoljavajuću pouzdanost te je, iz tog razloga, izbačen iz dalje obrade podataka. Neophodno je preciznije izmjeriti orijentacije koje se odnose na kratkoročne ciljeve, trenutnu dobit, nespremnost prihvatanja dubljih i trajnijih odgovornosti, kako bi se u potpunosti mapirala njihova (negativna) povezanost sa akademskim uspjehom. Takođe, sam akademski uspjeh ima različito subjektivno značenje i svrhu u očima osoba različitih životnih stilova. Tako bi osobe saznajnog stila mogle biti dominantno intrinzično motivisane, tačnije za njih je sticanje znanja i širenje intelektualnih vidika cilj u kome se uživa i koji je sam sebi svrha. Dok osoba kod koje je dominantno izražen prometejski aktivizam uspjeh u obrazovanju vidi kao sredstvo ostvarenja svojih humanističkih ideala (npr mladi agronom koji se bavi svojom strukom da bi oživio napuštena sela). Neophodno je shvatiti da je pojam zivotnog stila značajno širi od pojma akademskog uspjeha i da prožima sve oblasti ljudskog funkcionisanja. Upravo zbog toga može biti teško dokažati postojanje direktnih veza izmedju ove dvije varijable. Čak i formalno isti životni stilovi mogu poprimiti drastičnu drugačije oblike kod različitih oblika i u skladu s tim imati drugačije posljedice. Kod dvije različite osobe koje imaju izražen porodično-sentimentalni stil može biti faktor i akademskog uspjeha (školovanje da bi se obezbijedio bolji život svojoj porodici) ili neuspjeha (prekidanje školovanja da bi se u potpunosti posvetili roditeljskog ulozi).

DECLARATIONS OF INTEREST STATEMENT

The authors affirm that there are no conflicts of interest to declare in relation to the research presented in this paper.

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RELATIONSHIPS BETWEEN PERSONALITY TRAITS, LIFESTYLES AND ACADEMIC ACHIEVEMENT OF STUDENTS

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ABSTRACT

The term "lifestyle" is a central concept of Adler's theory of personality, which he defines as a characteristic pattern of behavior that is a manifestation of a unique way of perceiving, conceptualizing, behaving and personal striving towards a goal that is filled with subjective meaning and represents part of the striving for power (Croake, 1975). Personality traits represent dimensions of individual differences that relate to a person's tendency to exhibit consistent patterns of thought, feeling, and action (McCrae & Costa, 1985). The research sample consisted of a total of 211 respondents, mostly students of the University of East Sarajevo surveyed via online questionnaires, of which 135 were female and 76 were male. Measuring instruments with satisfactory measurement characteristics were used: Questionnaire for examining the Big Five personality model (Goldberg, 1992), a modified version of the Allport-Vernon-Lindzis value scale for measuring lifestyles, a Scale for examining the sociodemographic characteristics of the respondents, and a Scale for examining academic performance. The obtained data show that of all personality dimensions of the Big Five model, only conscientiousness has a statistically significantly positive correlation with achieved academic success expressed through the average grade in studies (r=.24), which is not surprising, because this is a trait that is consistently associated with academic and business success in a large number of studies. Four lifestyle styles statistically significantly correlate with achieved academic success: family-sentimental style (r=.15), cognitive style (r=0.16), popularity-oriented style (r=-.19) and Promethean activism (r=.15). Although none of the mentioned correlations are high, they indicate the undoubted existence of a connection between these constructs and the role that lifestyles as complex systems of values, goals, attitudes and beliefs play in determining the final forms of behavior and achieved results within the educational system.

Keywords: personality traits, lifestyles, academic success.

STAVOVI I STEREOTIPI ZDRAVSTVENIH RADNIKA O UZROCIMA I ELEMENTIMA SUICIDA

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APSTRAKT

Suicid predstavlja značajan problem u savremenom društvu, često opterećen brojnim predrasudama koje doprinose stigmatizaciji i otežavaju preventivne aktivnosti. Iako se smatra da su psihijatri i psiholozi ključni u prevenciji, uloga zdravstvenih radnika u primarnoj zdravstvenoj zaštiti je vrlo važna, s obzirom na njihovu dostupnost i prvi kontakt sa pacijentima. Cilj ovog istraživanja bio je ispitivanje stavova, uverenja i nivoa informisanosti zdravstvenih radnika (medicinskih sestara, lekara opšte prakse i specijalista) o suicidu, kao i identifikovanje obrazovnih i profesionalnih razlika koje utiču na formiranje ovih stavova. Istraživanje je sprovedeno tokom maja 2023. godine u dva doma zdravlja u Vojvodini i u njemu je učestvovalo 216 zdravstvenih radnika. Primenjen je upitnik, konstruisan na osnovu IKAB modela, koji obuhvata tri celine: društvena uverenja o suicidu, činjenične tvrdnje i lične stavove. Rezultati ukazuju da među ispitanicima postoje brojne predrasude u vezi sa suicidalnim ponašanjem, ali i da su medicinske sestre pokazale najmanji stepen netačnih uverenja. Značajne razlike u stavovima primećene su u odnosu na profesionalni status, pri čemu lekari opšte prakse češće izražavaju rigidnije stavove. Ukupna informisanost o suicidu bila je nezadovoljavajuća, posebno u segmentu činjeničnih znanja. Rezultati ovog istraživanja su ukazali na neophodnost dodatne edukacije zdravstvenih radnika, bez obzira na profesionalni profil, kako bi se umanjile predrasude i poboljšala efikasnost u prepoznavanju i reagovanju na suicidalne rizike. Ovi nalazi mogu da pomognu u kreiranju edukativnih i preventivnih programa usmerenih na smanjenje stigme i unapređenje podrške osobama u suicidnoj krizi.

Ključne reči: suicid, stavovi, zdravstveni radnici, primarna zdravstvena zaštita, prevencija

UVOD

Suicid je jedan od najvećih svetskih javno zdravstvenih problema, ističe se u izveštajima Svetske zdravstvene organizacije (Svjetska zdravstvena organizacija, [SZO], 2005), jer godišnje u celom svetu umre oko 800.000 ljudi usled samoubistva. Činjenica koja zabrinjava jeste da su pokušaji samoubistva oko 20 puta češći nego izvršena samoubistva. Iako su stope samoubistva tradicionalno najviše u populaciji starijih osoba muškog pola, stope suicida među mladim ljudima su porasle u toj meri da su oni postali grupa pod najvećim rizikom u značajnom broju zemalja (Faria, et al., 2022), pri čemu je stopa smrtnosti od samoubistava veća u manje razvijenim državama (Burton, 2021). Samoubistvo predstavlja drugi uzrok smrtnosti osoba među mladima između 15 i 29 godine oba pola (SZO, 2005). Mentalni poremećaji (naročito depresija i zloupotreba psihoaktivnih supstanci) su povezani sa više od 90% svih slučajeva samoubistava (SZO, 2000). Međutim, ne treba izgubiti iz vida da je samoubistvo kompleksni fenomen koji je rezultat različitih sociokulturnih i ličnih faktora, te da se rizik od samoubistva povećava u periodima socioekonomskih, porodičnih i individualnih kriza (npr. gubitak voljene osobe, prekid emotivne veze, gubitak posla ili imovine, kriza identiteta i slično. (Opalić, 2008).

Zdravstveni radnici u primarnoj zdravstvenoj zaštiti su dostupniji u odnosu na druge zdravstvene profesionalce, te je zato važno da oni imaju adekvatna uverenja u vezi sa suicidom. Zdravstveni radnici predstavljaju važnu kariku u prevenciji i upravljanju samoubilačkim mislima i ponašanjima (Bahamón, Javela, Ortega Bechara, Cabezas-Corcione, & Cudris-Torres, 2024; Jandial, et al., 2024; Kadioglu, et al., 2023; Sahin-Bayindir, & Comez-Ikican, 2025; Sela, & Levi-Belz, 2024; Woods, Hampton, Okoli, Heath, & Moreland, 2024). Na poverenje u brigu o pacijentima koji su izloženi riziku od samoubilačkih misli i ponašanja utiču poznavanje i stavovi prema samoubistvu (Boukouvalas, El-Den, Murphy, Salvador-Carulla, & O'Reilly, 2020). Stoga je važno da zdravstveni radnici poseduju adekvatnu informisanost i funkcionalne stavove, koji predstavljaju osnov prevencije suicida kao i osnov adekvatnog pružanja podrške. Ovo je važno i usled deficita određenih zanimanja u zdravstvenom sistemu, poput psihologa i psihijatara. Prema istraživanju Živanovića i saradnika (Živanović, Vukčević Marković, Dimoski, & Gvozden, 2022) u Srbiji je dostupan samo jedan psiholog na 22.000 stanovnika u sistemu zdravstvene zaštite, a skoro 2% stanovništva se nalazi pod visokim rizikom za suicid. Poznato je da nedostatak obučenog osoblja za uobičajene mentalne poremećaje doprinosi ciklusima lošeg mentalnog zdravlja i lošeg fizičkog zdravlja, istovremeno ometajući napore da se poboljša pristup i dostupnost nege (Raunig-Berhó, 2016). Percepcija javne ili socijalne stigmatizacije predstavlja nivo uverenja pojedinaca da će društvo negativno vrednovati ili diskriminisati osobe sa mentalnim poremećajem. Ukoliko je takvo uverenje široko rasprostranjeno unutar određene zajednice, bez obzira na druge sociodemografske karakteristike, može se zaključiti da u toj sredini postoji veći stepen društvene devalvacije i diskriminacije osoba sa mentalnim smetnjama (Živanović i sar., 2022). U svetu su istraživanja stavova prema suicidu nešto učestalije frekvence, dok je korpus istraživanja u Srbiji prilično manjih obima. Ovo ima i praktičan značaj u kontekstu razvoja protokola za rad sa pacijentima pod suicidalnim rizikom.

U novijem naučnom korpusu istraživanja, ispitivanje stavova prema suicidu i suicidualnom ponašanju je sve češće u fokusu tranverzalnih studija. Istraživanja sprovedena u Turskoj (Kadioglu, et al., 2023; Sahin-Bayindir, & Comez-Ikican, 2025) ispitivala su stavove osoblja hitne pomoći prema osobama koje su pokušale suicid. Rezultati su pokazali da su pozitivni stavovi i bolje poznavanje same problematike suicida bili povezani sa faktorima kao što su bračni status, nivo obrazovanja, profesija, radno mesto, prethodna obuka o radu sa suicidalnim pacijentima, godine iskustva u hitnoj službi i subjektivna procena kompetentnosti u radu sa ovim pacijentima. Autori preporučuju da se obuka o pristupu pacijentima sa suicidalnim ponašanjem uključi u formalne obrazovne programe, kao i da se sprovode dalja istraživanja o efektima takvih obuka na ishode pacijenata (Kadioglu, et al., 2023). S druge strane, u Kolumbiji je 2024. godine sprovedeno istraživanje koje je analiziralo stavove zdravstvenih profesionalaca prema suicidalnom ponašanju (Bahamón, et al., 2024). Većina ispitanika pokazala je neutralne stavove, što ukazuje na potencijalni nedostatak znanja, empatije ili sigurnosti u radu sa ovim pacijentima. Kliničko iskustvo identifikovano je kao ključni činilac u oblikovanju ovih stavova, s iskusnijim stručnjacima koji pokazuju nijansirano razumevanje okidača suicida i prevencije, te su ovi autori takođe istakli potrebu za dodatnom edukacijom i treningom kako bi se unapredila kompetentnost osoblja u prepoznavanju i reagovanju na suicidalno ponašanje (Bahamón, et al., 2024). Slični nalazi dobijeni su u Indiji (Jandial, et al., 2024). Rezultati ovog istraživanja ukazuju na to da su lekari, koji imaju više iskustva u radu, imali više znanja, ali i negativnije stavove u poređenju sa medicinskim sestrama, koje su pokazale više empatije uprkos manjem znanju. Ovo sugeriše da veća količina znanja o suicidu ne garantuje pozitivne stavove i da su potrebni dodatne instance u protokolima obuke zdravstvenih radnika (Jandial, et al., 2024). Studija iz Izraela ukazala je na to da su medicinske sestre koje su prošle obuku za upravljanje depresijom pokazivale veću spremnost da postavljaju pitanja o suicidnim idejama i upućuju pacijente na adekvatnu pomoć. Takođe su imale više samopouzdanja u proceni i intervenciji (Sela, & Levi-Belz, 2024). Na kraju, pilot studija iz SAD pokazala je da je veb-bazirana edukacija značajno unapredila znanje, stavove i spremnost medicinskih sestara da intervenišu kod suicidalnih pacijenata. Nakon edukacije, učesnici su pokazali veću empatiju i sklonost da potraže pomoć za sebe i druge (Woods, et al., 2024). Međutim, postoje i oprečni nalazi. Na primer, rezultati tajvanskog istraživanja iz 2023. godine, koje je sprovedeno među medicinskim sestrama (Huang, et al., 2023), pokazali su da su mlađe i manje iskusne medicinske sestre imale bolje rezultate na testu znanja i u proceni samopouzdanju u vezi sa prevencijom suicida u poređenju sa starijim medicinskim sestrama sa više iskustva, a autori su to pripisali početnom random entuzijazmu. Takođe, medicinske sestre koje su prethodno prošle specijalizovanu obuku pokazale su pozitivnije stavove i veću sigurnost u radu sa suicidalnim pacijentima (Huang, et al., 2023). Stoga se čini da istraživanja stavova o suicidu nailaze na prepreke usled nekonzistentnih obrazaca rezultata, što otvara polje novih istraživanja u kontekstu ove teme, pogotovo kada se govori o pojedinim kulturama u kojima i dalje postoji stigma prema ljudima koji imaju suicidalne misli i ideacije.

Jedan od savremenih modela o razvoju stavova prema suicidu, a ujedno i veoma korišćen kao teorijski okvir objašnjavanja u medicinskom kontekstu, jeste model IKAB (information, knowledge, action, behavior) model, odnosno model „informacije-znanje–stavovi–ponašanje“ (npr. Jing, et al., 2021; Wang, et al., 2022). Ovaj model polazi od pretpostavke da se ponašanje pojedinca menja kroz četiri međusobno povezana koraka: izloženost informacijama od značaja u kontekstu suicida u određenom društvu, sticanje znanja i poznavanje činjenica o suicidu, formiranje ili promena stavova na osnovu tog znanja i promena ponašanja kao krajnji ishod tog procesa (Pinfold, Thornicroft, Huxley, & Farmer, 2005). U kontekstu stavova prema suicidu, ovaj model se koristi za razumevanje kako edukacija o mentalnom zdravlju i suicidu može doprineti povećanju razumevanja i pozitivnijim stavovima prema radu sa suicidalnim ljudima, smanjenju stigme, razvoju empatije, i povećanju spremnosti da se pruži pomoć osobama koje su u riziku od suicida. IKAB model je veoma koristan za razvoj preventivnih programa, jer pokazuje da znanje ne samo da informiše, već i menja stavove, a pozitivni stavovi vode ka odgovornijem i humanijem ponašanju prema osobama u suicidnoj krizi. Upravo zato se ovaj model često koristi u zdravstvenom obrazovanju, kao i u obukama za profesionalce i nastavnike u obrazovnom sistemu.

Problem ovog istraživanja bio je usmeren na ispitivanje stavova medicinskog osoblja prema samoubistvu. Nalazi prethodnih istraživanja ukazuju na izvesne nedoslednosti kada se govori o iskustvu u radu sa suicidalnim pacijentima kao faktoru koji oblikuje te stavove. Većina studija ukazuje na to da sa povećanjem iskustva u radu sa suicidalnim pacijentima dolazi do razvijanja funkcionalnijih stavova. Cilj ovog istraživanja usmeren je na utvrđivanje u kojoj meri (procentu) su zdravstveni profesionalci određenih profila informisani u vezi sa tematikom suicida, te da li i u kojoj meri nivo obrazovanja predstavlja faktor koji oblikuje stavove vezi sa suicidom. Navedeno istraživanje može pomoći boljem razumevanju celokupne tematike suicida i adekvatnijem pružanju podrške sucidnim osobama, kao i u kreiranju novih programa edukacije i obuka za zaposlene u zdravstvu što bi ojačalo resurse prevencije suicida. Društvena opravdanost ovog rukopisa jeste objektivno sagledavanje stavova zdravstvenih radnika o problemu, odnosno uzrocima i elementima suicida u neposrednom i direktnom društvenom okruženju.

METODOLOGIJA ISTRAŽIVANJA

Uzorak i procedura istraživanja

U istraživanju je učestvovalo 216 ispitanika, zdravstvenih radnika koji rade na poziciji medicinske sestre, lekara opšte prakse i lekara specijaliste. U ukupnom uzorku je najviše bilo medicinskih sestara (116, 53.5%), zatim lekara opšte prakse (65, 30.4%) i najmanje lekara specijalista (35, 16.1%). Od navedenog broja ispitanika, 165 (76%) ispitanika je ženskog pola, dok je 52 (24%) muškog pola, dok je dužina radnog staža relativno ravnomerno raspoređena između ispitanika (Tabela 1).

Tabela 1. Radni staž ispitanika
Table 1. Respondent's length of service

Godine radnog staža	f	%
0–5	31	14.3
6–11	29	13.4
12–17	35	16.1
18–23	27	12.4
24–29	39	18.0
30–35	32	14.7
36–41	24	11.1

Istraživanje je sprovedeno u maju mesecu 2023. godine u Domu Zdravlja Novi Bečej i Bečej, putem *Google Forms* platforme ili u papir-olovka formatu. Ispitivanje je bilo potpuno anonimno, a na samom početku su ispitanicima predočeni cilj i svrha istraživanja, saglasnost za učestvovanje u istraživanju, kao i informacije o zaštiti i anonimnosti podataka. Ispitanici nisu dobijali nikakvu nadoknadu za učešće u istraživanju, s obzirom na to da je učestvovanje bilo na dobrovoljnoj bazi.

Instrumenti istraživanja

Anketiranje ispitanika koji spadaju u ciljnu grupu (medicinske sestre, lekari opšte prakse, lekari specijaliste), obavljeno je anonimnim upitnikom koji je kreiran od strane autora ovog rada, a koji je konstruisan u skladu sa praksom i radom sa pacijentima. Upitnik se sastoji od tri dela: Društvena uverenja o samoubistvu (npr. *Suicidalnost je nasledna*), Činjenice o suicidnom ponašanju (npr. *Osoba najčešće počini suicid u ranim jutarnjim časovima*) i Lični stavovi i osećanja prema problematici suicida (npr. *U životu sam često razmišljao o samoubistvu*). Navedena struktura upitnika je izabrana u skladu sa IKAB modelom formiranja stavova u kontekstu suicida, po uzoru na druga istraživanja (Jing, et al., 2021; Wang, et al., 2022).

Na ajteme koji se odnose na društvena uverenja o suicidu ispitanici su mogli da odgovore sa – Da, Ne i Nisam siguran/a, a pouzdanost skale je α = 0.584 na osnovu čega se može zaključiti da je pouzdanost poprilično niska. Kada je u pitanju deo upitnika koji se odnosi na Upoznatost sa činjenicama o suicidnom ponašanju ispitanici su odgovarali sa – Tačno, Netačno, Nisam siguran/a, pouzdanost skale je α = 0.512 na osnovu čega se može zaključiti da nije pouzdana. U poslednjem delu upitnika koji se odnosi na stavove i osećanja, ispitanici, zdravstveni radnici, su odgovarali na petostepenoj Likertovoj skali koja se kretala od uopšte se ne slažem (najniža ocena 1), do u potpunosti se slažem (najviša ocena 5), čija pouzdanost takođe nije bila zadovoljavajuća α = 0.268.

Metode obrade podataka

Statistička obrada podataka i analize su urađene pomoću softvera IBM SPSS (Statistical Package of Social Science) verzija 20. Za opis uzorka upotrebljena je deskriptivna i frekvencijska statistika. Za ispitivanje razlika između ispitivanih grupa upotrebljen je Hi kvadrat test i jednofaktorska analiza varijanse (ANOVA). Za graničnu vrednost značajnosti je korišćen nivo od 0.01.

REZULTATI ISTRAŽIVANJA

U okviru prve grupe pitanja ispitivane su uverenja i predrasude prema suicidu kod medicinskog osoblja zaposlenog u primarnoj zdravstvenoj zaštiti. Ispitivana uverenja o suicidu mogu da utiču na način na koji će korisniku, odnosno pacijentu biti pružena podrška tokom procesa oporavka, kao i na ukupni nivo razumevanja osoba koje prolaze kroz suicidne krize. U cilju ispitivanja razlika između obrazovnih grupa primenjen je hi kvadrat test za nezavisne uzorke.

Prva tvrdnja glasi – „*Osobe koje govore da će se ubiti, zapravo nemaju nameru to da učine*.“ Ova tvrdnja nije tačna i potvrdan odgovor pokazuje da postoji prisustvo zablude o suicidu. Istina je da većina suicidnih osoba ispoljava određena upozorenja. Kada se pogledaju odgovori prezetovani u Tabeli 2 može se zaključiti da se sa istom u najvećoj meri slažu lekari specijalisti i lekari opšte medicine, dok se medicinske sestre najmanje slažu sa ovom tvrdnjom. Imajući u vidu da istraživanja pokazuju da između 60% i 80% ispitanih daje znake da razmišlja i planira suicid pre njegovog izvršenja (Isometsä, & Lönnqvist, 1998; Robins, Murphy, Wilkinson Jr, Gassner, & Kayes, 1959) može se reći da su medicinske sestre najviše upoznate sa ovim tendencijama i najmanje sklone netačnom uverenju. Na osnovu odgovora ispitanika i procentualnog udela može se zaključiti da između posmatranih grupa postoji statistički značajna razlika ($\chi^2(2) = 21.32$, $p < 0.05$).

Druga tvrdnja u ovom delu upitnika glasi „*Ako nekoga pitate da li razmišlja o samoubistvu, zapravo ga podstičete na to*“. Ova tvrdnja je jedna od najčešćih zabluda u vezi sa suicidom (Dazzi, Gribble, Wessely, & Fear, 2014). U Tabeli 2 su prikazani odgovori ispitanika, koji ukazuju da u sve tri ispitivane grupe najveći je broj negativnih odgovora. Nalazi stručnjaka ukazuju da je otvoreni i direktan razgovor o suicidu način da se osobi olakša patnja i pruži podrška u trenucima krize (Dazzi, et al., 2014; Gould, et al., 2005). Ovakav stav ima i između polovine i 2/3 zdravstvenih radnika, što pokazuje da 67% ispitanih medicinskih sestara, 60% lekara opšte prakse i 54% lekara specijalista ne veruje ovoj tvrdnji. Na osnovu odgovora ispitanika i procentualnog udela može se zaključiti da između posmatranih grupa ne postoji statistički značajna razlika ($\chi^2(2) = 3.34$, $p = 0.51$).

Treća tvrdnja opisuje kontinuitet i (ne)promenjivost suicidalnosti kod osobe – „*Ako je neko suicidan, uvek će biti suicidan*“. Dosadašnji nalazi ukazuju da su osobe koje su suicidne uglavnom to u određenom vremenskom periodu kada ocenjuju da je patnja, bol i/ili pritsak neizdrživ (Shneidman, 1996; Troister, & Holden, 2010). Ipak, ukoliko se okolnosti promene ili osoba dobije adekvatnu podršku, suicidalnost se može smanjiti i nestati. Većina ispitanih se sa ovom tvrdnjom slaže, i slaganje je zasebno najčešći odgovor u svim ispitivanim grupama – medicinske sestre (50%), lekari opšte medicine (64%) i lekari specijalisti (60%) (Tabela 2). Na osnovu odgovora ispitanika i procentualnog udela može se zaključiti da između posmatranih grupa ne postoji statistički značajna razlika ($\chi^2(2) = 7.06$, $p = 0.13$).

Četvrta tvrdnja glasi – „*Suicidna osoba uvek daje neke znake upozorenja*“. Dosadašnja istraživanja pokazuju da šest meseci pred suicid osobe koje o njemu razmišljaju daju svojoj okolini znake upozorenja (npr. Isometsä, & Lönnqvist, 1998). Ipak, ovi znaci mogu ostati neprimećeni i time se smanjuje mogućnost preventivnog delovanja. Na osnovu odgovora ispitanika može se reći da je slaganje sa navedenom tvrdnjom najprisutnije kod lekara specijalista, zatim kod medicinskih sestara, a najmanje kod lekara opšte medicine. Većina ispitanika smatra da je ova tvrdnja tačna. Na osnovu odgovora ispitanika i procentualnog udela odgovora može se zaključiti da između posmatranih grupa ne postoji statistički značajna razlika ($\chi^2(2) = 6.26$, $p = 0.18$).

Peta tvrdnja ukazuje na determinisanost u suicidnom razmišljanju, definisana je kao „*Ako je neko rešio da se ubije, ništa ga neće zaustaviti.*“. Prema kumulativnim odgovorima u Tabeli 2 može se videti da je u svim grupama najzastupljeniji odgovor „da“. Odnosno zdravstveni radnici nemaju uvid da je većina osoba do samog čina suicida ambivaletna i sklona tome da odustane. Kada se posmatraju odgovori podgrupa u uzorku, uviđa se da je najveći procenat negativnih, odnosno ispravnih odgovora bio kod medicinskih sestara (28%), a zatim kod lekara opšte prakse (21%) i lekara specijalista (22%). Ipak, tendencije u sve tri grupe su podjednake, a razlike među njima nisu značajne ($\chi^2(2) = 3.62$, $p = 0.18$).

Šesta tvrdnja je jedna od zastupljenih predrasuda, da bolje raspoloženje osobe koja je imala suicidne misli, ili pokušaj suicida, označava i prestanak rizika: „*Ako se depresivna ili suicidna osoba bolje oseća, to* *znači da je problem prošao*". Kada se pogledaju odgovori prezentovani u Tabeli 2. može se zaključiti da je kod medicinskog osoblja navedena predrasuda slabo zastupljena. Od ukupnog broja ispitnaih, 79% veruje da je iznet stav netačan, dok se samo 10.6% slaže sa tvrdnjom. U najmanjem procentu je ova zabluda prisutna kod medicinskih sestara, dok su lekari opšte medicine izrazili nesigurnost u značajnijem procentu od ostalih grupa ispitanika. Na osnovu odgovora ispitanika i procentualnog udela odgovora može se zaključiti da između posmatranih grupa postoje statistički značajne razlike ($\chi^2(2) = 17.72$, $p < 0.01$).

Sledeća ispitivana tvrdnja je bila ona o naslednosti suicidnog ponašanja. Dosadašnji teorijski i istraživački dometi pokazuju da su određeni problemi mentalnog zdravlja, kao što je depresivnost, a koji se vezuju za suicidalnost – nasledni u određenom procentu (Mirkovic, et al., 2016; Mullins, et al., 2021). Kao što se može videti iz Tabela 2 ispitanici se ne slažu sa iznetom tvrdnjom, odnosno imaju ispravan stav. Procentualno je najviša nesigurnost prisutna kod medicinskih sestara. Rezultati hi-kvadrata su statistički značajni i samim tim su i razlike u stavovima između ispitivanih grupa veoma izražene ($\chi2(2) = 17.69$, $p < 0.01$).

Osma tvrdnja u grupi ajtema kojom se obrađuju društvena uverenja o suicidu glasi: „*Suicid izvršavaju isključivo mentalno obolele osobe*". Tvrdnja nije tačna i predstavlja predrasudu usled koje porodica i prijatelji teže uočavaju znake suicidnih misli kod bliskih osoba koje nemaju dijagnostikovane probleme sa mentalnim zdravljem (npr. Nock, et al., 2008). Raspodela odgovora ispitanika je prikazana u Tabeli 2. Zdravstveni radnici se u većini slučajeva ne slažu sa ovom tvrdnjom (69%), a procentualno najmanje slaganje ispoljavaju medicinske sestre. Najveći stepen slaganja sa predrasudom da je suicid delo mentalno obolele osobe zabeležen je kod lekara specijalista (23%). Primenjen Hi kvadrat test pokazuje da između posmatranih grupa ne postoje statistički značajne razlike ($\chi2(2) = 11.37$, $p < 0.05$).

Često se pojava suicida dovodi u vezu i sa egzistencijalnim problemima, te je u društvu prisutna predrasuda da suicid izvršavaju samo osobe iz nižih (siromašnih) slojeva društva. Podaci navedeni u Tabeli 2 pokazuju da se medicinski radnici ne slažu sa ovom tvrdnjom, a zanimljivo je da ni jedna ispitana medicinska sestra nije odgovorila sa „da" ili „nisam sigurna". Broj odgovora ovog tipa je niži i kod lekara specijalista i lekara opšte medicine. Primenjen hi-kvadrat u slučaju ove tvrdnje nije bio statistički značajan, te se ne može govoriti o razlikama između navedenih grupa ispitanika ($\chi2(2) = 15.51$, $p < 0.01$).

Sa prethodnom predrasudom je povezana i predrasuda da „*Suicid izvršavaju samo osobe iz viših (bogatih) slojeva društva.*" Iza ove predrasude stoji uverenje da je suicid čin do kog dolazi ponekad iz hira ili prevelikih mogućnosti. Kao što je ranije navedeno, suicid je jednako prisutan u svim društvenim slojevima. Na osnovu rezultata predstavljenih u Tabeli 2 može se zaključiti da je ova predrasuda najprisutnija kod lekara opšte prakse, a najmanje prisutna kod medicinskih sestara. Većina ispitanika, odnosno 89%, ne slaže se sa ovom tvrdnjom. Na osnovu odgovora ispitanika i procentualnog udela odgovora može se zaključiti da između posmatranih grupa postoje statistički značajne razlike ($\chi^2(2) = 20.22$, $p < 0.01$).

Poslednja tvrdnja u prvom delu upitnika je definisana kao oblik poželjnog ponašanja – „*Suicidnu osobu treba oraspoložiti*". Stručnjaci iz oblasti mentalnog zdravlja ukazuju da je sa suicidnom osobom potrebno otvoreno razgovarati o tegobama koje je muče i ne požurivati oporavak (Dazzi, et al., 2014). Na osnovu podataka prikazanih u Tabeli 2 može se videti da su svi medicinski radnici skloni tome da pokušaju da oraspolože suicidnu osobu, kao vid pomoći. Najveći procenat nesigurnosti prema ovom pitanju pokazuju medicinske sestre. Na osnovu odgovora ispitanika i procentualnog udela može se zaključiti da između posmatranih grupa postoje statistički značajne razlike ($\chi^2(2) = 12.21$, $p < 0.05$).

Iz skupa tvrdnji koje opisuju najčešća uverenja u društvu o suicidu i ponašanju suicidnih osoba zaključuje se da su one u određenim granicma prisutne i u širem zdravstvenom sistemu. Na određenim tvrdnjama, koja se tiču samog ponašanja ili klasifikacije osoba sklonih suicidu (bogati, siromašni, mentalno oboleli), najmanje predrasuda pokazuju medicinske sestre.

Tabela 2. Slaganje ispitanika o društvenim uverenjima o samoubistvu

Tvrdnje		Da	Ne	Nisam siguran	χ^2	p
Osobe koje govore da će se ubiti, zapravo nemaju nameru to da učine.	Medicinske sestre	26 (22.4%)	26 (22.4%)	64 (55.2%)	21.32	<0.0005*
	Lekar opšte prakse	33 (50%)	13 (19.7%)	20 (30.3%)		
	Lekar specijalista	19 (54.3%)	6 (17.1%)	10 (28.6%)		
Ako nekoga pitate da li razmišlja o samoubistvu, zapravo ga podstičete na to.	Medicinske sestre	20 (17.2%)	78 (67.2%)	18 (15.5%)	3.34	0.503
	Lekar opšte prakse	17 (25.8%)	40 (60.6%)	9 (13.6%)		
	Lekar specijalista	10 (28.6%)	19 (54.3%)	6 (17.1%)		
Ako je neko suicidan, uvek će biti suicidan.	Medicinske sestre	58 (50%)	44 (37.9%)	14 (12.1%)	7.06	0.133
	Lekar opšte prakse	42 (63.6%)	16 (24.2%)	8 (12.1%)		
	Lekar specijalista	21 (60%)	7 (20%)	7 (20%)		
Suicidna osoba uvek daje neke znake upozorenja.	Medicinske sestre	64 (55.2%)	37 (31.9%)	15 (12.9%)	6.26	0.180
	Lekar opšte prakse	27 (40.9%)	23 (34.8%)	16 (24.2%)		
	Lekar specijalista	20 (57.1%)	8 (22.9%)	7 (20%)		
Ako je neko rešio da će da se ubije, ništa ga neće zaustaviti.	Medicinske sestre	62 (53.4%)	33 (28.4%)	21 (18.1%)	3.62	0.459
	Lekar opšte prakse	38 (57.6%)	15 (22.7%)	13 (19.7%)		
	Lekar specijalista	16 (45.7%)	8 (22.9%)	11 (31.4%)		
Ako se depresivna ili suicidna osoba bolje oseća, to znači da je problem prošao.	Medicinske sestre	3 (2.6%)	92 (79.3%)	21 (18.1%)	17.72	0.001*
	Lekar opšte prakse	13 (19.7%)	40 (60.6%)	13 (19.7%)		
	Lekar specijalista	7 (20%)	23 (65.7%)	5 (14.3%)		
Suicidnost je nasledna.	Medicinske sestre	10 (8.6%)	77 (66.4%)	29 (25%)	17.69	0.001*
	Lekar opšte prakse	10 (15.2%)	40 (60.6%)	16 (24.2%)		
	Lekar specijalista	13 (37.1%)	18 (51.4%)	4 (11.4%)		
Suicid izvršavaju isključivo mentalno obolele osobe.	Medicinske sestre	15 (12.9%)	92 (79.3%)	9 (7.8%)	11.37	0.023
	Lekar opšte prakse	16 (24.2%)	38 (57.6%)	12 (18.2%)		
	Lekar specijalista	8 (22.9%)	21 (60%)	6 (17.1%)		
Suicid izvršavaju samo osobe iz nižih (siromašnih) slojeva društva.	Medicinske sestre	0 (0%)	116(100%)	0 (0%)	15.51	0.004*
	Lekar opšte prakse	1 (1.5%)	61 (92.4%)	4 (6.1%)		
	Lekar specijalista	2 (5.7%)	30 (85.7%)	3 (8.6%)		
Suicid izvršavaju samo osobe iz viših (bogatih) slojeva društva.	Medicinske sestre	1 (0.9%)	113(97.4%)	2 (1.7%)	20.22	<0.0005*
	Lekar opšte prakse	9 (13.6%)	54 (81.8%)	3 (4.5%)		
	Lekar specijalista	4 (11.4%)	27 (77.1%)	4 (11.4%)		
Suicidnu osobu treba oraspoložiti.	Medicinske sestre	68 (58.6%)	22 (19%)	26 (22.4%)	12.21	0.016
	Lekar opšte prakse	47 (71.2%)	13 (19.7%)	6 (9.1%)		
	Lekar specijalista	29 (82.9%)	5 (14.3%)	1 (2.9%)		

*Statistička značajnost na nivou od 0.01

Druga celina u upitniku odnosila se na poznavanje činjenica o suicidu. Prva tvrdnja opisuje ambivalenciju osobe koja razmišlja o suicidu, odnosno oko odluke da li želi da prekine svoj život. To ukazuje da se suicid događa nakon perioda u kom se dvoumi oko same odluke. Odgovori ispitanika na ovu tvrdnju dati u okviru Tabele 3. Medicinske sestre u najvećoj meri (57%) nisu sigurne da li je ovo tačno, a podjednak broj veruje da je ova tvrdnja tačna (21%), odnosno netačna (22%). Kod lekara opšte medicine veći broj njih veruje da je tvrdnja tačna (37%), u odnosu na onaj broj koji smatra da je netačna (23%). Ipak najveći broj ispitanih nije siguran (40%). Lekari specijalisti pre svega veruju da su suicidne osobe ambivalentne (46%), a najmanji procenat je onih koji su izjavili da nisu sigurni (23%). Razlike između grupa ispitanika su statistički značajne, prema rezultatima sprovedenog hi-kvadrat testa ($\chi2(2) = 16.26$, $p < 0.01$).

Druga tvrdnja se odnosi na godišnje doba kada se najčešće izvršava samoubistvo. Istraživanja i dosadašnji podaci pokazuje da je porast primetan u proleće (Ajdacic-Gross, et al., 2010; Woo, Okusaga, & Postolache, 2020). Na osnovu podataka prikazanih u Tabeli 3, može se videti da veliki broj ispitanika u svim grupama nije siguran u vezi sa tačnošću ove tvrdnje. Sa druge strane ispravan odgovor „tačno" je najmanje zastupljen u svim grupama. Odgovor „netačno" je procentualno najzastupljeniji kod medicinskih sestara (50%). Na osnovu odgovora ispitanika i procentualnog udela odgovora može se zaključiti da između posmatranih grupa ne postoje statistički značajne razlike ($\chi^2(2 = 8.98$, $p = 0.06$).

Naredna tvrdnja se odnosi na doba dana kada je suicid najčešći – rani jutarnji časovi. Na osnovu podataka prikazanih u Tabeli 3, može se videti da su raspodele odgovora kod lekara opšte prakse i medicinskih sestara slične, te da prednjači odgovor *„Nisam siguran"*, a sledi ga odgovor *„Netačno"*. Kod svih grupa je manji procenat ispravnih odgovora, odnosno odgovora „*Tačno*". Ali kod lekara specijalista je frekventnost ovog odgovora ipak veća u odnosu na odgovor „*Nisam siguran*." Na osnovu odgovora ispitanika i njihovih procentualnih udela može se zaključiti da između posmatranih grupa ne postoje statistički značajne razlike ($\chi^2(2 = 5.92$, $p = 0.21$).

Jedna od malo poznatih činjenica u vezi sa problemom suicida je njegova prisutnost u društvu, a posebno odnos broja pokušaja suicida i izvršenih suicida. Prema svetskoj zdravstvenoj organizaciji (SZO, 2005) broj pokušaja samoubistava je 20 puta veći nego broj izvršnih suicida. Na osnovu dobijenih odgovora prikazanih u Tabeli 3 može se reći da medicinske sestre u najvećoj meri odgovaraju ispravno (60%), a najmanje to čine lekari specijalisti, koji su i najmanje sigurni koji je tačan odgovor na ovu tvrdnju (48.5%). Na osnovu odgovora ispitanika i procentualnog udela tih odgovora može se zaključiti da između posmatranih grupa postoje statistički značajne razlike ($\chi^2(2) = 15.07$, $p < 0.01$).

Poslednja tvrdnja u okviru druge grupe pitanja tiče se postupaka u cilju prevencije suicida – „*Ukoliko ste primetili da osoba pati, gubi volju za životom, treba joj ponuditi razgovor*." Dubinski, neosuđujući i saosećajni razgovor može smanjiti deo patnje osobe koja ima suicidne misli (Dazzi, et al., 2014). Rezultati ovog istraživanja ukazuju na to da se svi ispitanici u velikoj većini slučajeva slažu sa ovom tvrdnjom, dok samo jedan lekar specijalista odgovara sa „Netačno" i šest lekara opšte medicine sa „Nisam siguran", odnosno postoji tendencija u odgovorima koji se grupišu u jednoj koloni. Na osnovu odgovora ispitanika i procentualnog udela odgovora može se zaključiti da između posmatranih grupa postoje statistički značajne razlike ($\chi^2(2) = 19.28$, $p < 0.01$).

Nakon pregleda odgovora ispitanika prema ispitivanim činjenicama o suicidu može se videti da zdravstveni radnici ne poseduju dovoljno informacija o karakteristikama ljudi koji pokušaju ili počine suicid, kao i o karakteristikama okolnosti pod kojima to čine, a koje mogu biti značajne u prevenciji takvog ponašanja. Između obrazovnih profila se na pojedinim mestima javljaju razlike, u korist medicinskih sestara ili lekara specijalista.

Tabela 3. *Slaganje ispitanika o činjenicama o suicidnom ponašanju*

Tvrdnje		Da	Ne	Nisam siguran	χ^2	p
Suicidne osobe su ambivalentne.	Medicinske sestre	24 (20.7%)	26 (22.4%)	66 (56.9%)	16.26	0.003*
	Lekar opšte prakse	25 (37.9%)	15 (22.7%)	26 (39.4%)		
	Lekar specijalista	16 (45.7%)	11 (31.4%)	8 (22.9%)		
Osoba najčešće izvršava suicid početkom proleća.	Medicinske sestre	17 (14.7%)	58 (50%)	41 (35.3%)	8.98	0.062
	Lekar opšte prakse	16 (24.2%)	20 (30.3%)	30 (45.5%)		
	Lekar specijalista	10 (28.6%)	13 (37.1%)	12 (34.3%)		
Osoba najčešće izvršava suicid u ranim jutarnjim satima.	Medicinske sestre	17 (14.7%)	49 (42.2%)	50 (43.1%)	5.92	0.205
	Lekar opšte prakse	14 (21.2%)	24 (36.4%)	28 (42.4%)		
	Lekar specijalista	11 (31.4)	14 (40%)	10 (28.6%)		
Pokušaji samoubistva su oko 20 puta češći nego izvršena samoubistva.	Medicinske sestre	70 (60.3%)	4 (3.4%)	42 (36.2%)	15.07	0.005*
	Lekar opšte prakse	32 (48.5%)	11 (16.7%)	23 (34.8%)		
	Lekar specijalista	12 (34.3%)	6 (17.1%)	17 (48.6%)		
Ukoliko ste primetili da osoba pati, gubi volju za životom, treba joj ponuditi razgovor.	Medicinske sestre	116(100%)	0 (0%)	0 (0%)	19.28	0.001*
	Lekar opšte prakse	60 (90.9%)	0 (0%)	6 (9.1%)		
	Lekar specijalista	34 (97.1%)	1 (2.9%)	0 (0%)		

* Statistička značajnost na nivou od 0.01

Treća celina u upitniku je obuhvatala lične stavove prema samoubistvu i iskustva u vezi sa ovom temom. Kao što se vidi iz Tabele 4 tvrdnje sa kojima se zdravstveni radnici najviše slažu su one koje su usmerene na važnost ljudskog kontatka i prihvatanja („*Ljudski kontakt, pažnja i saosećanje su osnovne emocionalne potrebe i umanjuju nivo stresa.*“, „*Slušanje u poverenju i prihvatanje bez predrasuda mogu ublažiti ljudsku nesreću i osećanja koja vode do samoubistva*.“). Stepen slaganja sa tvrdnjama kod ova dva ajtema je iznad proseka u svim podgrupama ispitanika. Najmanje slaganja je, sa druge strane, sa ajtemima koji se tiču ličnog odnosa ka suicidu, odnosno prisustvu suicidnih misli: „*U životu sam često razmišljao o samoubistvu.*“, kao i ka ulozi zdravstvenog sistema u prevenciji suicidalnosti, odnosno isključivosti njene uloge „*Samo zdravstveni radnici mogu pružati podršku suicidnim osobama.*“

Na osnovu rezultata ANOVA testa prikazanih u Tabeli 4 može se zaključiti da značajna razlika postoji za tvrdnju „*Samo zdravstveni radnici mogu da pruže podršku suicidnim osobama*“ u odnosu na radno mesto ispitanika. Na osnovu post hoc testa je utvrđeno da značajne razlike postoje između medicinskih sestara i lekara opšte prakse ($p < 0.01$), gde je stepen slaganja viši kod lekara opšte prakse u odnosu na medicinske sestre za postavljenu tvrdnju. Za ostale tvrdnje ne postoji značajna razlika u odgovorima ispitanika u odnosu na radno mesto.

Tabela 4. Razlike u ličnim stavovima i osećanjima prema problematici suicida

Tvrdnje	MS (N=116)	LOP (N=66)	LS (N=35)	F	p
	Srednja vrednost				
Osetio bih strah kada bi mi bliska osoba rekla da razmišlja o samoubistvu.	4.04 ± 1.39	3.56 ± 1.26	3.62 ± 1.19	3.256	0.040
U životu sam često razmišljao o samoubistvu.	1.75 ± 1.27	1.68 ± 0.99	1.25 ± 0.50	2.720	0.068
Samo zdravstveni radnici mogu pružati podršku suicidnim osobama.	1.87 ± 1.24	2.54 ± 1.49	2.22 ± 1.43	5.336	0.005*
Ljudski kontakt, pažnja i saosećanje su osnovne emocionalne potrebe i umanjuju nivo stresa.	4.38 ± 1.12	4.24 ± 0.92	4.45 ± 0.95	0.611	0.544
Slušanje u poverenju i prihvatanje bez predrasuda mogu ublažiti ljudsku nesreću i osećanja koja vode do samoubistva.	4.22 ± 1.15	4.15 ± 0.99	4.00 ± 1.35	0.522	0.594
Svako ima pravo da donosi suštinske odluke o sopstvenom životu, uključujući i odluku da izvrši samoubistvo.	2.50 ± 1.36	2.51 ± 1.44	2.62 ± 1.41	0.116	0.890
Osoba koja razmišlja o samoubistvu ima potrebu da priča o tome i svom problemu.	2.87 ± 1.41	2.81 ± 1.08	2.85 ± 1.21	0.035	0.966

*Statistička značajnost na nivou od 0.01

Odgovori ispitanika u okviru poslednje celine ukazuju na to da kod zdravstvenih radnika u najvećem broju pitanja stepen obrazovanja nije od značaja za procenu stavova i iskustva koja se odnose na suicid. Značajno je navesti da zdravstveni sektor prepoznaje značaj direktnog, ljudskog pristupa i vidi mogućnost da im ostali sektori, a ne samo zdravstveni, pomognu u procesu prevencije suicida. Ipak, prisutne su i predrasude koje ukazuju da zdravstveni radnici u manjoj meri prepoznaju potrebu pacijenta da o ovome razgovara, ako oseti potrebu.

DISKUSIJA REZULTATA

Cilj ovog istraživanja bio je usmeren na utvrđivanje toga u kojoj meri su zdravstveni profesionalci određenih profila informisani u vezi sa tematikom suicida, te da li i u kojoj meri nivo obrazovanja predstavlja faktor koji oblikuje stavove vezi sa suicidom. Rezultati ovog istraživanja u velikoj meri potvrđuju nalaze prethodnih studija (Čanković i sar., 2013; Ćurković, Makarić, Bljakčori, Mesarić, i Brečić, 2023; Čukić i Ašanin, 2004).

Rezultati istraživanja ukazuju na prisustvo brojnih zabluda među zdravstvenim radnicima o prirodi suicida, što može imati ozbiljne posledice na procenu rizika i kvalitet pružene pomoći. Jedna od najopasnijih zabluda, prisutna posebno kod lekara, jeste verovanje da osobe koje govore da će se ubiti zapravo nemaju nameru to da učine. Međutim, brojna istraživanja ukazuju na suprotno – većina suicidnih osoba prethodno šalje određene signale i upozorenja (Biro, 1982; Isometsä, & Lönnqvist, 1998; Robins, et al., 1959). U ovom istraživanju, medicinske sestre su bile najmanje sklone toj zabludi, što se može objasniti prirodom njihovog posla koji podrazumeva intenzivniju i dugotrajniju komunikaciju s pacijentima, za razliku od lekara koji su često usmereni na dijagnostiku i terapiju. Ovaj nalaz ukazuje na potrebu da se u okviru edukacije lekara u većoj meri integrišu teme iz oblasti emocionalne inteligencije i komunikacije u kriznim situacijama. S druge strane, većina ispitanika, nezavisno od profesionalnog statusa, nije podržala tvrdnju da razgovor o suicidu može podstaći osobu da izvrši samoubistvo – što je u skladu sa nalazima studija koje pokazuju da otvoreni razgovor zapravo ima zaštitni efekat (Dazzi, et al., 2014; Gould, et al., 2005; Dedić, 2014). Ovakav stav ukazuje na delimičnu prisutnost edukacije o suicidu među zdravstvenim radnicima, ali i na prihvatanje savremenih pristupa u radu sa osobama koje imaju suicidalne misli. Zabrinjavajući je nalaz da se značajan broj učesnika slaže sa tvrdnjom „ako je neko suicidan, uvek će biti suicidan“. Ova tvrdnja je netačna, jer suicidalne misli najčešće imaju epizodičan karakter i povezane su sa akutnim krizama ili psihosocijalnim stresorima (Shneidman, 1996; Troister, & Holden, 2010). Ovde se ponovo ističe uloga edukacije u razbijanju mitova i razumevanju dinamike suicidnog ponašanja. Još jedan čest mit odnosi se na pogrešno tumačenje poboljšanja raspoloženja kao znak izlaska iz suicidne krize. U stvarnosti, naglo poboljšanje može ukazivati na to da je osoba donela konačnu odluku o suicidu, što paradoksalno povećava rizik (Frankl, 2019; Jovčić, 2023). Iako većina ispitanika u ovom istraživanju ne podržava ovu zabludu, značajan broj lekara opšte prakse pokazao je nesigurnost po ovom pitanju, što ukazuje na potrebu za dodatnim obukama o kliničkom praćenju suicidnog rizika. Kada je reč o genetici, većina ispitanika se ne slaže sa tvrdnjom da je suicidalnost nasledna, što pokazuje određeni nivo razumevanja etiologije suicida. Iako genetski faktori mogu igrati ulogu, suicidalno ponašanje nije direktno determinisano naslednim predispozicijama (Crosby, Ortega, Stevens, 2011; Kapamadžija, Šovljanski, Biro, 1990; Mullins, et al., 2021; Mirkovic, et al., 2016). Takođe, većina zdravstvenih radnika ne deli uverenje da suicid izvršavaju isključivo osobe sa dijagnostikovanim mentalnim poremećajima, što je u skladu sa nalazima koji ukazuju da se suicidalne misli mogu javljati i kod osoba bez prethodne psihijatrijske dijagnoze, usled kriznih životnih okolnosti (Oquendo, et al., 2014; Nock, et al., 2008). Ipak, među lekarima specijalistima primećena je viša učestalost ove predrasude, što može biti rezultat strožeg kliničkog fokusa i usmerenosti na dijagnostičke kategorije. Društvene predrasude u vezi sa klasnom pripadnošću takođe su prisutne. Tvrdnje da suicid češće pogađa siromašne ili bogate slojeve društva nisu bile podržane među većinom ispitanika. Ipak, lekari opšte prakse pokazuju veću sklonost ovim pojednostavljenim pogledima, dok su medicinske sestre bile najkonzistentnije u odbacivanju ovih stavova (Congdon, 2012). Ovo može ukazivati na potrebu da se u edukaciji o suicidu više pažnje posveti razumevanju kompleksnih socijalnih determinanti i razbijanju stereotipa. Na kraju, skoro svi ispitanici se slažu sa tvrdnjom da suicidnoj osobi treba pokušati pomoći time što će je neko „oraspoložiti“. Iako ova tvrdnja može delovati empatično, ona ukazuje na ograničeno razumevanje prirode suicidne patnje – trivijalizacija emocionalne krize pokušajem „ohrabrivanja“ bez dubljeg razumevanja može biti nedelotvorna ili čak kontraproduktivna (Jovčić, 2023). Značajno je da su medicinske sestre iskazale najveći stepen nesigurnosti po ovom pitanju, što bi se moglo tumačiti kao pokazatelj njihove opreznosti ili svesti o kompleksnosti problema.

Drugi segment istraživanja bio je fokusiran na proveru znanja zdravstvenih radnika o empirijski potvrđenim činjenicama vezanim za suicid, koje imaju ključnu ulogu u pravovremenom prepoznavanju rizika i prevenciji. Jedno od centralnih pitanja odnosilo se na ambivalentnost suicidalnih osoba, odnosno na ideju da suicid nije posledica čvrste, nepromenljive odluke, već rezultat unutrašnjeg konflikta i kolebanja. Ova tvrdnja je naučno utemeljena – brojne studije ističu da se većina suicida događa nakon perioda u kojem osoba oscilira između želje da okonča patnju i nade da će doći do promene (Otsuka, et al., 2015; Shneidman, 1996). U aktuelnom istraživanju, lekari specijalisti su pokazali najveći stepen slaganja sa ovom tvrdnjom, što može biti posledica njihovog većeg kliničkog iskustva u radu sa pacijentima sa psihijatrijskim simptomima. Sledeće pitanje odnosilo se na sezonski obrazac u stopama suicida. Na osnovu ranijih istraživanja, poznato je da suicidi imaju sezonsku varijaciju, sa izraženim porastom u prolećnim mesecima (Ajdacic-Gross, et al., 2010; Woo, et al., 2020). Ipak, rezultati ovog istraživanja ukazuju na to da većina ispitanika, posebno medicinskih sestara, nije bila sigurna u tačnost ove informacije. Ovaj nalaz može ukazivati na nedostatak poznavanja epidemioloških karakteristika suicida i sugeriše potrebu da se ovakve teme uvrste u programe kontinuirane edukacije. Još jedna činjenica koja se proveravala odnosila se na doba dana kada su suicidi najčešći. Istraživanja su pokazala da rani jutarnji sati predstavljaju period povećanog rizika, ali je u našem uzorku mali broj zdravstvenih radnika bio upoznat sa tom informacijom, dok su dominirali odgovori „netačno" i „nisam siguran". Posebno je zanimljivo da su lekari specijalisti, iako najobrazovaniji među ispitanicima, retko prepoznavali ovaj obrazac. Ovaj nalaz sugeriše da čak ni formalno obrazovanje ne garantuje poznavanje specifičnih kliničkih i statističkih aspekata suicidalnosti. U vezi sa prevalencijom pokušaja samoubistva, Svetska zdravstvena organizacija navodi da su pokušaji suicida čak 20 puta češći od izvršenih suicida (SZO, 2005). Ova činjenica je od ključnog značaja za procenu i upravljanje rizikom. U aktuelnom istraživanju, medicinske sestre su najčešće davale tačan odgovor, dok su lekari specijalisti pokazali najviši nivo nesigurnosti. Ova razlika može biti posledica svakodnevnog rada sestara sa pacijentima u postakutnim stanjima, uključujući i one koji su pokušali suicid, što povećava njihovu izloženost ovakvoj problematici i razvija intuitivno znanje. Najzad, posebno je ohrabrujući nalaz da se velika većina ispitanika, bez obzira na profesionalni profil, saglasila sa tvrdnjom da je razgovor sa osobom koja pokazuje znake patnje i gubitka volje za životom poželjan i koristan. Ovo pokazuje da zdravstveni radnici prepoznaju značaj pravovremene verbalne intervencije kao jednog od osnovnih alata u prevenciji suicida (Altinanahtar, & Sari, 2012; Bailey, Yocum, Russell, 2015). Međutim, ostaje otvoreno pitanje kvaliteta i strukture tog razgovora – jer izražena spremnost da se razgovor vodi ne podrazumeva automatski i kompetenciju da se isti realizuje na način koji ne banalizuje ili dodatno retraumatizuje osobu u krizi.

Treća celina upitnika bila je usmerena na ispitivanje emocionalnih i ličnih stavova zdravstvenih radnika prema suicidu, kao i na njihovu percepciju profesionalne i društvene uloge u prevenciji suicida. Analiza odgovora pokazuje da su najviše prosečne ocene postignute kod stavova koji reflektuju humanistički i empatičan pristup – poput tvrdnji da su „ljudski kontakt, pažnja i saosećanje osnovne emocionalne potrebe koje umanjuju nivo stresa" i da „slušanje u poverenju i prihvatanje bez predrasuda mogu ublažiti ljudsku nesreću i osećanja koja vode ka samoubistvu". Svi profesionalni profili (medicinske sestre, lekari opšte prakse i specijalisti) iskazali su visoko slaganje sa ovim tvrdnjama, što ukazuje na prisustvo osnovne emocionalne senzibilnosti za problematiku suicida i razumevanje važnosti interpersonalne podrške. S druge strane, najniže prosečne ocene zabeležene su kod tvrdnji koje se odnose na lična iskustva i uverenja ispitanika, kao što je: „U životu sam često razmišljao o samoubistvu". Ovakav nalaz je očekivan i može ukazivati na društvenu poželjnost odgovora, ali i na stigmu koja okružuje iskazivanje ličnih suicidalnih misli čak i u anonimnim uslovima. Posebnu pažnju zaslužuje tvrdnja „Samo zdravstveni radnici mogu pružati podršku suicidnim osobama", koja je imala različite ocene u zavisnosti od profesionalne grupe. Naime, lekari opšte prakse su u značajno većoj meri pokazivali slaganje sa ovom tvrdnjom, dok su medicinske sestre bile znatno kritičnije, što može reflektovati razlike u percepciji sopstvene profesionalne kompetentnosti ili hijerarhijske pozicije u zdravstvenom sistemu. Ovaj nalaz sugeriše da lekari mogu imati tendenciju ka ekskluzivističkom pogledu na ulogu struke, dok su medicinske sestre otvorenije za interdisciplinarni i inkluzivan pristup u radu sa osobama koje se suočavaju sa suicidalnim mislima.Važno je naglasiti da kod ostalih tvrdnji nije utvrđena statistički značajna razlika između grupa, što ukazuje na relativno ujednačenu emocionalnu i profesionalnu orijentaciju ka problemu suicida među različitim profilima zdravstvenih radnika. Ovi nalazi su u skladu sa prethodnim istraživanjima koja sugerišu da radno iskustvo i neposredni kontakt sa pacijentima mogu doprineti razvoju empatije i razumevanja, ali da to ne garantuje odsustvo profesionalnih predrasuda (Raunig-Berhó, 2016; Ćurković i sar., 2023; Faria, et al., 2022). U svetlu ovih nalaza, može se zaključiti da iako među zdravstvenim radnicima postoji opšti konsenzus o važnosti ljudske podrške u prevenciji suicida, i dalje postoje profesionalne razlike u razumevanju granica kompetentnosti i uključenosti različitih sektora u sistemu podrške. Edukativni programi bi trebalo da podstiču transdisciplinarnu saradnju i promovišu uverenje da prevencija suicida zahteva učešće celokupne zajednice – uključujući porodicu, prijatelje, nastavnike, ali i stručnjake izvan zdravstvenog sistema.

S obzirom na veličinu problema, preporučuje da se prevenciji samoubistva da prioritet, kako u pružanju nege, tako i u razvoju politike javnog zdravlja. U ovom kontekstu, mobilizacija zdravstvenih službi je neizbežna, pošto okruženje primarne zaštite često pruža početne akcije i korake za zaštitu mentalnog zdravlja (ovde se ukazuje na izazov, jer je nedovoljan broj stručnjaka koji bi se bavio ovim problemom). Po pitanju nege oni su u jedinstvenoj poziciji da prepoznaju subjekta sa suicidalnim rizikom, pošto je primarna zdravstvena zaštita prvi kontakt sa zdravstvenom mrežom, te u skladu sa time potraže pomoć psihologa i psihijatra. Ali u praksi to nije uvek tako, jer su zabeleženi negativni stavovi stručnjaka, kada rade sa osobama sa samoubilačkim ponašanjem, obično usled faktora kao što su nepripremljenost ili teškoće u suočavanju sa ovim zahtevom, pružanje ograničene početne nege i često upućivanje pacijenata na druge službe, što u velikoj meri kompromituju kvalitet nege i pomoći. Potrebno je kod zdravstvenih radnika koji se bave ovim problemom obavljati konstantno usavršavanje, u cilju kako bi pacijentima pristupali sa pozitivnim stavom (nasuprot vrlo često negativnim stavovima usled ličnih uverenja, ili naglasak na rutinske kontrole umesto na psihološku podršku, uz nedovoljno znanja i veština). Ostaje da se utvrdi, da li stručna obuka o suočavanju sa suicidalnim ponašanjem, može da pomogne u boljem zbrinjavanju suicidalnih pacijenata (Faria, et al., 2022; Burton, 2021; Boukouvalas, et al., 2020).

Buduća istraživačka perspektiva trebalo bi da se fokusira na dalje bavljenje ovom tematikom, a posebno preduzimanju mera preventivnog delovanja u pravcu suzbijanja suicida. Potrebno je podići svest o tome da postoje realne opasnosti koje loša društvena kominikacija, finansijska situacija, nelečene mentalne bolesti, neblagovremeno intervenisanje zdravstvenih radnika, spasilačkih i drugih službi nose i primarno su vezane za uzrokovanje suicida. Dobijeni rezultati u okviru istraživanja mogu pomoći u kreiranju novih programa edukacije i obuke za zaposlene u zdravstvenim i obrazovnim ustanovama s ciljem jačanja resursa u prevenciji suicida.

ZAKLJUČAK

Zdravstveni radnici u primarnoj zdravstvenoj zaštiti različitih profila i obrazovanja su najdostupniji i najraspoloživiji u odnosu na druge zdravstvene profesionalce pa je zato važno da oni imaju ispravna uverenja u vezi sa suicidom i da budu otvoreni za takvu vrstu problema. Zbog toga je neophodno da što veći broj zdravstvenih profesionalaca bude otvoren za problem suicida, da nema pogrešna uverenja i stavove u vezi sa tim.

Iz skupa tvrdnji koje opisuju najčešća uverenja u društvu o suicidu i ponašanju suicidnih osoba možemo videti da su one u određenim granicama prisutne i odražavaju se i u širem zdravstvenom sistemu. Na određenim pitanjima koji se tiču samog ponašanja ili klasifikacije osoba sklonih suicidu (bogati, siromašni, mentalno oboljeli) najmanje predrasuda pokazuju medicinske sestre.

Između obrazovnih profila se na pojednim mestima javljaju razlike, u korist medicinskih sestara ili lekara specijalista. Potrebno je znanje među zdravstvenim radnicima zapravo unaprediti i ujednačiti, kako pacijenti ne bi dobijali dvostruke ili neodređene poruke od strane medicinskog tima tokom tretmana. Odgovori ispitanika u okviru poslednje celine ukazuju da kod zdravstvenih radnika u najvećem broju pitanja stepen obrazovanja nije od značaja za procenu stavova i iskustva koja se tiču suicida. Značajno je navesti da zdravstveni sektor prepoznaje značaj direktnog, ljudskog pristupa i vidi mogućnost da im ostali sektori, a ne samo zdravstveni pomognu u procesu prevencije suicida. Ipak, prisutne su i predrasude koje ukazuju da zdravstveni radnici u manjoj meri prepoznaju potrebu pacijenta da o ovome razgovara, ako oseti potrebu.

Imajući u vidu oskudan korpus istraživanja teme stavova o suicidu kod zdravstvenih i prosvetnih radnika, može se zaključiti da sprovedeno istraživanje pruža značajan doprinos ovoj oblasti na domaćoj populaciji. Dobijeni rezultati u okviru ovog istraživanja mogu pomoći u kreiranju novih programa edukacije i obuke za zaposlene u zdravstvu, ali i u prosvetnim ustanovama, što bi ojačalo resurse prevencije suicida.

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ATTITUDES AND STEREOTYPES OF HEALTHCARE WORKERS ON THE CAUSES AND ELEMENTS OF SUICIDE

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ABSTRACT

Suicide represents a significant issue in modern society, often burdened by numerous prejudices that contribute to stigmatization and hinder preventive efforts. While psychiatrists and psychologists are typically viewed as central figures in suicide prevention, the role of primary healthcare professionals is equally important due to their accessibility and position as first points of contact with patients. The aim of this study was to examine the attitudes, beliefs, and level of knowledge about suicide among healthcare professionals (nurses, general practitioners, and specialists), as well as to identify educational and professional differences that influence the formation of these attitudes. The research was conducted in May 2023 in two primary healthcare centers in Vojvodina, Serbia, with a sample of 216 healthcare professionals. A questionnaire based on the IKAB model was used, comprising three sections: societal beliefs about suicide, factual knowledge, and personal attitudes. The results indicate the presence of numerous misconceptions about suicidal behavior among participants; however, nurses demonstrated the lowest level of inaccurate beliefs. Significant differences in attitudes were observed based on professional status, with general practitioners more frequently expressing rigid viewpoints. Overall knowledge about suicide was insufficient, particularly regarding factual content. These findings highlight the need for additional training of healthcare professionals, regardless of their role, in order to reduce prejudices and improve the effectiveness of suicide risk recognition and response. The study's outcomes may serve as a foundation for developing educational and preventive programs aimed at reducing stigma and enhancing support for individuals in suicidal crisis.

Keywords: suicide, attitudes, healthcare professionals, primary healthcare, prevention.

Prilog 1.

Upitnik

Poštovani/a,
pred vama se nalazi kratak upitnik kojim nastojimo da procenimo vaše stavove o problematici samoubistva. Upitnik je anoniman i rezultati će biti upotrebljeni u svrhu pisanja istraživačkog rada.

Trenutno radim na poziciji:
a) Medicinska sestra b)Lekar opšte prakse c)Lekar specijalista

Društvena uverenja o samoubistvu

Osobe koje govore daće se ubiti, zapravo nemaju nameru to da učine.	da	ne	Nisam siguran/a
Ako nekoga pitate da li razmišlja o samoubistvu, zapravo ga podstičete na to.	da	ne	Nisam siguran/a
Ako je neko suicidan, uvek će biti suicidan.	da	ne	Nisam siguran/a
Suicidna osoba uvek daje neke znake upozorenja.	da	ne	Nisam siguran/a
Ako je neko rešio da se ubije ništa ga neće zaustaviti.	da	ne	Nisam siguran/a
Ako se depresivna ili suicidna osoba bolje oseća, to znači da je problem prošao	da	ne	Nisam siguran/a
Suicidnost je nasledna.	da	ne	Nisam siguran/a
Suicid izvršavaju isključivo mentalno obolele osobe.	da	ne	Nisam siguran/a
Suicid izvršavaju samo osobe iz nižih (siromašnih) slojeva društva.	da	ne	Nisam siguran/a
Suicidnu osobu treba oraspoložiti	da	ne	Nisam siguran/a

Činjenice o suicidnom ponašanju

Suicidne osobe su često ambivalentne.	Tačno	Netačno	Nisam siguran/a
Osoba najčešće izvršava suicid početkom proleća.	Tačno	Netačno	Nisam siguran/a
Osoba najčešće izvršava suicid u ranim jutarnjim satima.	Tačno	Netačno	Nisam siguran/a
Pokušaji samoubistva su oko 20 puta češći nego izvršena samoubistva.“	Tačno	Netačno	Nisam siguran/a
Ukoliko ste primetili da osoba pati, gubi volju za životom, treba joj ponuditi razgovor.	Tačno	Netačno	Nisam siguran/a

Lični statovi i osećanja prema problematici suicida

Tvrdnja	**U potpunosti se ne slažem**	**Uglavnom se ne slažem**	**Nisam siguran/a**	**Uglavnom se slažem**	**U potpunosti se slažem**
Osetio bih strah kada bi mi bliska osoba rekla da razmišlja o samoubistvu.	1	2	3	4	5
U životu sam često razmišljao o samoubistvu.	1	2	3	4	5
Samo zdravstveni radnici mogu pružati podršku suicidnim osobama.	1	2	3	4	5
Ljudski kontakt, pažnja i saosećanje su osnovne emocionalne potrebe i umanjuju nivo stresa.	1	2	3	4	5
Slušanje u poverenju i prihvatanje bez predrasuda mogu ublažiti ljudsku nesreću i osećanja koja vode do samoubistva.	1	2	3	4	5
Svako ima pravo da donosi suštinske odluke o sopstvenom životu, uključujući i odluku da izvrši samoubistvo.	1	2	3	4	5
Osoba koja razmišlja o samoubistvu ima potrebu da priča o tome i svom problemu.	1	2	3	4	5

ENHANCING INSURANCE SERVICES IN SERBIA WITH APPLICATION OF THE SERVQUAL MODEL

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ABSTRACT

This paper tries to highlight the importance of identifying dimensions of service quality and their impact on the satisfaction and loyalty of users of services provided by insurance companies in the Republic of Serbia. The focus of the study is on analyzing the key parameters of service quality and user satisfaction. The aim of the paper is to investigate the differences between expected and perceived characteristics of insurance services based on the Servqual model. The total sample in this research is 112 respondents. The specific objectives are the analysis of the differences in the ratings of the dimensions of the expected and observed attributes of the Servqual scale in relation to socio-demographic variables, such as gender, age and level of education. Based on the results of empirical research, it was concluded that all service quality parameters play a key role in user satisfaction. The results show that the five basic dimensions of Servqual – tangibility, reliability, accountability, security and empathy – have a significant and positive association with overall perceived service quality.

Keywords: Insurance services, Serbia, consumer behavior, satisfaction, the Servqual model.

INTRODUCTION

Business society is in a phase of deep transformation, which is the result of constant changes in the external and internal environment. Contrary to previous times in which the success of a company and a national economy was measured by the amount of products produced and sold, today's post-industrial knowledge society is increasingly turning to the service sector (Boljević, Premović, i Stojanović, 2014). However, what is definitely different in the changes that are happening in our lives compared to the changes that were in force throughout any period of history, as remind Vaselić, & Janjetović (2024) is the increase in the speed and intensity of these changes, which is especially expressed in the last 30 years, with the significant expansion of the digital technological revolution.

The fact that services represent more then 55% of the world's total economy, compared to industry and agriculture, which participate with 45%, indicates the undoubted strategic importance of services. It is considered that 65% of the income of developed countries comes from service activities, and modern tendencies expressed through the increase in importance and representation of services, support the assumptions that in about 30 years, services will be represented in the global world economy with as much as 85%. In modern business, there is a shift from products to services that are created in such a way as to satisfy the growing needs of consumers, thus reducing the border between products and services more and more. In order to successfully respond to the challenges of globalization and constant changes, companies, as well as national economies, must meet the demands of consumers who are looking for high-quality and sophisticated services and products at the right price, at the right time and in the required quantity (Premović, 2016). As authors (Radivojević, Džino, Radivojević, & Džino, 2022, p. 28) emphasize a dynamic and turbulent business environment and modern business conditions are characterized by a competition on the one hand and increasing expectations of customers and users of services on the other hand.

LITERATURE REWIEV

From Lombardy and the first saved insurance policy back in 1182, through the first laws passed in Barcelona in 1435 and Florence in 1522, to the beginning of the 19th century, and especially with the emergence of private property, the insurance sector has been constant development. Modern insurance, as a service economic activity that protects people and their property from the consequences of numerous dangers and risks, is becoming more and more prevalent in recent decades and years, with a tendency for further growth especially after Covid 19.

In service business, there is a belief that providing quality service requires paying more attention to the customer. Customer satisfaction is a parameter that evaluates the success of a business system on the market, but also customer satisfaction is an important element in the process of evaluating the quality of services or products. Namely, in the modern market conditions of business in which the service sector occupies an increasingly dominant place, the provision of quality service represents a significant source of diversification and realization of competitive advantages.

There are many various factors which influence the customer satisfaction. Starting from the fact that service delivery involves a complex interaction influenced by numerous factors, Susan Keaveney suggests adopting a holistic marketing approach in service organizations. Given that the outcome of services, as well as whether or not people will remain loyal to a service provider, depends on a number of variables, the author has identified more than 800 critical behaviors that influence customers' decisions to switch to other service companies. These behaviors can be classified into eight categories: pricing, poor service responses, inconvenience, competition, core service failure, ethical issues, early service failure, and forced switching (Kotler, & Keller, 2006, p. 411).

Numerious authors (such as Suchánek, Solomon, Aimee, Oliver, Keller, Kotler, Parasuraman, Zeithalm, Berry, Sureshchandar, Loan, Cruz, Seyedi, Naumovska Saveska, Tomovska Misoska, Efremov, Petrovska, Rod, Ashill, Szwajca, Ngo, Pavelkova, Hussain, Srivastava, Sharma, Saghier, Bilan, etc.) agree that one of the most important factor for the customer satisfaction achieving is the quality of service.

Quality is defined as perceived quality of the customer, so the main factor in measuring product quality is customer satisfaction itself. To achieve high customer satisfaction, it is important for the company to create products that meet the requirements of its customers (Aimee, 2021).

The perception of service quality arises as a result of comparing consumer expectations with the actual characteristics of the specific service provided to them. These perceptions about services are formed by customers based on several sources, such as previous experiences, information received from others, propaganda etc., and they change depending on changes in the attitudes of consumers themselves, due to changes in service quality, and the like. Customer satisfaction and service quality is one of the most important business strategies of insurers companies. Satisfied clients are a key factor in the formation of clients' desire to buy future products/services (Loan, 2023).

Customer satisfaction is generally known as an outcome of service quality. In other words, the more positive customers‘ perceived service quality, the better their satisfaction level with the service provider is likely to be (Aimee, 2021).

In the service industry, the overall service quality of enterprises determines the level of customer satisfaction and loyalty. Meanwhile, it is the key to increasing the market share of enterprises (Lei, et al., 2022).

In the context of relationship marketing, customer satisfaction is often viewed as a central determinant of customer retention. Customer satisfaction is a key metric for insurance companies to monitor in order to gauge which areas of their customer service are strong and which areas need improvement in order to maintain or increase their membership base (Coviello, & Di Trapani, 2012).

Consumer satisfaction should be the basic purpose or goal of an organization's existence. The term satisfaction for service users or customer satisfaction often has different meanings: happiness, relief, achievement of a goal, achievement of customer satisfaction can be viewed from different aspects: psychological, sociological and economic (Huskić i Mešić, 2012, pp. 72-73).

Kotler, & Keller (2006) defined satisfaction as a customer's emotional response to a product/service experience. This response is developed based on the perceived frustration and expectations of the customer's service performance. A group of academics believed that customer satisfaction can create not just because of a single experience but can result from various backgrounds. Thus, customer satisfaction is defined as an affective, cognitive response that emerges in response to a single or prolonged set of service encounters (Loan, 2023).

Satisfied customers tend to stay loyal with products that can satisfy their needs and wants (Mohd Suki, 2017). (Source: Leng Khoo, 2022).

Consumer satisfaction serves as a driving force in cultivating consumer loyalty toward a company's offerings (Ali et al., 2021).

According to the Yum, & Kim, (2024) customer satisfaction builds trust as positive experiences foster confidence in the brand or provider. Loyalty, the ultimate goal, is the result of consistently positive experiences, trust, and satisfaction; that is, loyal customers choose to repeatedly engage with a brand and promote it to others, ultimately contributing to long-term business success.

Some authors have devoted special attention to researching customer satisfaction from the economic aspect of impact on the company's competitiveness and achieving business success in the long-term (Ilieva, Yankova, lisarova, Dzhabarova, Suchánek, Králová, Loan, Coviello, Di Trapani, Agnihotri, Yang, Briggs, Leng Khoo and others). Since satisfied customers are more likely to become loyal customers, customer satisfaction is an important performance indicator of the company’s effectiveness (Ilieva, Yankova, Klisarova, & Dzhabarova, 2022). In their research on the customer satisfaction Suchánek, & Králová (2019, p. 1239) pointing out the importance of customers knowledge and knowledge from customer too.

Customer-oriented business strategy is becoming the most crucial strategy of companies. In today's competitive environment, customers are the deciding factor for the company's existence. The company that wins the attention and loyalty of customers, that company will have sustainable development. Therefore, studying customer satisfaction with the company's products is an important job that needs to be done continuously and regularly to promptly meet customer needs (Loan, 2023).

Customer satisfaction is a measure of how products and the services provided meet or surpass customer expectations (Kotler, & Armstrong, 2018). It refers to the final state of a process in which the customers evaluate the perceived benefits obtained from using service (Oliver, 2010). (Source: Leng Khoo, 2022).

As several authors (Tzeng, Ertz, Jo, & Sarigöllü, 2021; Dash, Kiefer, & Paul, 2021; Islam et al., 2021) point out, customer satisfaction is an outcome that arises from the relationship between service providers and customers, serving as an indicator of the extent to which customers are content with the services they have gotten (Source: Abbas, 2023).

A study conducted by Agnihotri, Yang, & Briggs (2019) reported that customer satisfaction with the sales personnel has a significant positive influence on customers' willingness to pay more. This shows that when customers' needs are met efficiently, the satisfaction will drive them to spend more money and make more repeated purchase.

Consumer product satisfaction is an ongoing, dynamic process. Satisfaction is important to the providing firm not only to make immediate profit and earn more business, but because satisfaction and regret determine future visits and loyalty in the long-term. If a company wants customers to perceive their products or services as valuable, customer satisfaction must be fulfilled (Zameer et al., 2015). (Source: Leng Khoo, 2022).

Customer satisfaction holds significant weight in determining repurchase decisions and the frequency of service utilization (Prasetyo et al., 2021; Budur & Poturak, 2021). Brand sensitivity can impact repurchase behavior, as it pertains to the degree to which brands are significant in the decision-making process for selecting a product or service (Eren, 2021), (Source: Abbas, 2023).

A business cannot be imaginary while not client as a result of client is that the lifetime of a business. Once the business is far harder and competitive, company's profit is higher from client satisfaction comparatively (Sarmad, et al., 2020).

In the context of insurance customer satisfaction, existing empirical evidence indicates that lower expenses and combined ratios in the presence of satisfied customers are due to an increasing number of renewed contracts (instead of new policies), with reduced costs for customer acquisition. Therefore, increasing customer satisfaction is discussed to enhance the profitability of insurance operations (Pooser and Browne 2018). Jahnert and Schmeiser (2021) extend the investigations on the relation between customer satisfaction and profitability in the insurance industry by analyzing data at the level of individual customers stemming from a Swiss non-life insurance company (Source: Eckert, Neunsinger, & Osterrieder, 2022).

Regardless of the different attitudes and aspects of observing the matter in question, based on the studied and presented literature, it can be concluded that today customer satisfaction represent undoubtedly very important business strategy for service companies which is receiving more and more attention day by day.

Intangibility, heterogeneity, perishability and inseparability are some of the basic characteristics of the service because of which the issue of customer satisfaction in every service industries is quite difficult to determine. Additionally, the customer satisfaction is affecting by different factors or dimensons. Some of the more pronounced are: tangibility, reliability, responsibility, security, competence, empathy.

MATERIALS AND METHODS

The primary objective of this research is to assess the quality of insurance services provided by insurance companies in Serbia, with the quality evaluation conducted using the **Servqual model**. The secondary objective is to provide insurance companies with insights into how they can better connect with customers and enhance the current level of service quality. In line with the research objectives, the following hypotheses were formulated: **Main Hypothesis**: Insurance service users perceive a difference between expected and observed service quality. **Auxiliary Hypotheses**:

- **H1**: Insurance service users have the highest expectations regarding the reliability dimension.
- **H2**: Insurance service users have the highest expectations regarding the assurance dimension.
- **H3**: Insurance service users have the highest expectations regarding the responsiveness dimension.

- **H4**: Insurance service users have the highest expectations regarding the tangibles dimension.
- **H5**: Insurance service users have the highest expectations regarding the empathy dimension.

Certain limitations were identified during the research process. These limitations stemmed from the model itself, as well as the insufficient number of responses collected, with some questionnaires containing incomplete answers. To address these challenges, a customized questionnaire based on the **Servqual model** was developed, specifically adapted for insurance companies. The questionnaires were distributed via email, accompanied by a request for participation in the study. However, some respondents declined to participate for unknown reasons, while others did not use the services provided by insurance companies. A total of 112 completed questionnaires were selected for analysis. In addition to these challenges, the data collection method has limitations related to the representativeness of the sample. Regardless of the sample size, it does not meet strict statistical representativeness criteria, as highlighted in the literature (Evans & Mathur, 2005). The indicators of customer satisfaction cannot be measured, therefore every educational institution had a different standard of customer satisfaction. Most customer satisfaction surveys focus on how something is done and not what is done. Some research has focused on a relationship between satisfaction and identity with the mission of the organization. The conceptual model to measure the service quality was called as SERVQUAL model. (Bahri, & Herawan, 2020). The Servqual model is one of the most commonly used models for measuring service quality, which contains all the necessary factors of service expectations and experiences (Parasurman et al., 1988). It is adaptable with multiple service activities. The evaluation is done on a scale from 1 (I do not agree at all) to 5/7/10 (I absolutely agree). The Servqual model measures five dimensions of service quality. These are: reliability; responsibility; tangibility; security and empathy (Veljković, 2009; Veljković, 2006). In most cases, researchers use both scales. Although in recent years this questionnaire has been modified in accordance with IT technologies. Historically speaking, this model originates in the 80s of the last century and is often used in research in the service sector. The first model was established by Groonros in 1982 based on two dimensions of service quality, technical and functional, then it was based on the result of the service received and the process of providing the service (Grönroos, 1984; Grönroos, 2000). Therefore, this model is most often used for marketing purposes and is an important instrument for evaluating the quality of services (Parasurman et al., 1991). It is used in the analysis and evaluation of consumer opinions most often in service organizations (Carman, 1990). Based on previous research, we can come to the conclusion that a smaller number of scientific and professional research has been carried out for the elements and characteristics of services and their observation in the context of client satisfaction (Roopchund & Boojhavon, 2014). The Servqual method is an acceptable and tested method, which is most often applied in the service sector (Pavlović, Radonjić, & Pavlović, 2023). We have a number of researchers who have contributed to the modification of the Servqual model that is used today to measure service quality in the banking sector as well (Ladhari, Ladhari & Morales, 2011; Rakesh & Anoop, 2012; Ilias, Khare, Malek, & Bhan2013; Panda & Kondasani, 2014, Roslan, Wahab, & Abdullah, 2015; Kiumarsi, Jaiaraman, & Mohd-Isa, 2015). Kancir (2006) indicates that the use of the Servqual model by categories and groups is effective and contributes to the determination of specific goals that improve the quality of the service tested (Kancir, 2006). Some researchers are of the opinion that the Servqual scale determines the feeling of satisfaction after the service has been performed and that the researcher cannot come up with answers that indicate customer satisfaction. In addition to existing criticisms, this model is extremely desirable and acceptable for measuring satisfaction due to its nature and can be applied in all service activities (Pavlović & Tešić, 2023).

The aim of this research is to examine respondents' satisfaction with the services of insurance companies in Serbia. For that purpose, authors created an original empirical survey of respondents from the theritory of Serbia with a Satisfaction Insurance Companies (SIC) scale and a questionnaire on the sociodemographic characteristics of the respondents.

As specific objectives, authors specify examining differences in satisfaction with the quality of insurance company services in relation to gender, age, level of education, place of residence, marital status, level of monthly income and work status of rendents.

In this research was used folowing Statistical methods and techniques:

- To display the structure of the sample - frequencies (f) and percentages (%)
- To check the reliability of the instrument, Cronbach's alpha coefficient
- To display the expressiveness of the results - Arithmetic Mean (AS), Standard Deviation (SD), Minimum (MIN) and Maximum (MAX)
- t test for independent samples (t) and significance (p) for comparing differences in categorical variables with two categories
- Analysis of variance, ANOVA (F) and its significance (p) for comparing differences in categorical variables with more than two categories and post hoc test (LSD)

Sample research

In research participated local population from four regions in Serbia: from Belgrade, Vojvodina, Šumadija amd Western Serbia, Southeast Serbia and South Serbia. The total research sample consists of 112 respondents N=112) of both gender, different ages, marital and financial status. The research was conducted in the period from mid-September to mid-October 2024 in such a way that the respondents were sent an invitation to participate in the research via email with the explanation that the research is completely anonymous and that the obtained data will be used for the purpose of creating a scientific paper. The analysis was performed using SPSS software version 26.0 in December 2024.

When it comes to the gender of the respondents (Table 1), slightly more than half of the total research sample consists of male respondents (57.1%) and slightly less than half of female respondents (42.9%). The sample is approximately uniform according to the gender of the respondents.

Table 1. Structure of the sample in relation to the gender of the respondents

Gender	f	%
Man	64	57,1
Female	48	42,9
Total (∑)	112	100,0

In relation to the age of the respondents (Table 2), most of the respondents included in this research, more than half of the entire research sample, are aged between 36 and 55 years (60.7%). In addition, 21.4% of respondents are 56 to 65 years old and 17.9% are 25 to 35 years old. Respondents younger than 25 or older than 65 did not participate in the research. The sample is not uniform according to the age of the respondents.

Table 2. Structure of the sample in relation to the age of the respondents

Age	f	%
25-35	20	17,9
36-55	68	60,7
56-65	24	21,4
Total (∑)	112	100,0

When we talk about the structure of the sample in relation to the level of education (Table 3), only university students participated in the research. Namely, almost two-thirds of the entire research sample consists of respondents with the title of Doctor of Science (67.9%). After that, respondents with a master's degree are next in terms of representation, making up 21.4% of the entire research sample, and 10.7% are respondents with a university degree. The sample is not uniform according to the level of education of the respondents.

When it comes to the respondent's place of residence (Table 4), the majority of respondents reside in the region of Vojvodina (39.3%), followed by the same percentage of respondents residing in the Belgrade region and the region of Southern and Eastern Serbia (21.4%). The least number of survey respondents reside in the region of Šumadija and Western Serbia - 17.9%. The sample is not uniform according to the respondent's place of residence.

Table 3. Structure of the sample in relation to the level of education

Degree of education	f	%
Faculty	12	10,7
Master's degree (MSc)	24	21,4
Doctor of Science (PhD)	76	67,9
Total (∑)	112	100,0

Table 4. Structure of the sample in relation to the respondent's place of residence

Place of residence- region	f	%
Belgrade	24	21,4
Vojvodina	44	39,3
Šumadija and Western Serbia	20	17,9
Southern and Eastern Serbia	24	21,4
Total (∑)	112	100,0

In relation to the marital status of the respondents (Table 5), by far the largest number of survey respondents, as many as three quarters of the entire research sample, are married or cohabiting (75.0%). In addition, 17.9% of respondents are single, and 3.6% of respondents are divorced or widowed. The sample is not uniform according to the marital status of the respondents.

When we talk about the amount of monthly income of the respondents (Table 6), most respondents from the research have incomes greater than 60,000 dinars (89.3%). In addition, 3.6% of respondents have incomes from 50,000 to 60,000 dinars, and 7.1% of respondents did not want to reveal the amount of their monthly income. Respondents with incomes lower than 50,000 dinars did not participate in the research, and the sample was not uniform according to the level of monthly income of the respondents.

When it comes to the work status of the respondents (Table 7), the survey includes respondents who are employed, which make up 96.4% of the entire sample, and respondents who are retired - 3.6%. Unemployed respondents, as well as respondents who are studying, did not participate in the research. The research sample is not uniform according to the working status of the respondents.

Table 5. Structure of the sample in relation to the marital status of the respondents

Marital status	f	%
Single/Unmarried	20	17,9
Married/Community	84	75,0
Divorced	4	3,6
A widower	4	3,6
Total (∑)	112	100,0

Table 6. Structure of the sample in relation to the monthly income of the respondents

Monthly income	f	%
50,000 to 60,000 rsd	4	3,6
More than 60,000 rsd	100	89,3
I don't want to say	8	7,1
Total (∑)	112	100,0

Table 7. Structure of the sample in relation to the work status of the respondents

Work status	f	%
Work status	108	96,4
Pensioner	4	3,6
Total (∑)	112	100,0

Research results

The aim of this research, as been told, was to examine respondents' satisfaction with the services of insurance companies in Serbia. In order to conduct the research, a Satisfaction with Insurance Companies (SIC) scale and a questionnaire on the sociodemographic characteristics of the respondents (gender, age, level of education, place of residence, marital and work status of the respondents) were created.

Reliability of the instrument

The SIC scale consists of 22 closed-ended questions or statements with answers offered on a five-point Likert scale from 1- absolutely disagree to 5- completely agree. The items of the scale are divided into 5 dimensions or subscales: from questions 1 to 4 of the dimension of tangibility, from 5 to 9 of the dimension reliability, from 10 to 13 of the questions of the dimension of responsibility, from 14 to 17 of the questions of the dimension of security and from 18th to 22nd dimension of empathy.

The reliability of the scale is measured by Cronbach's alpha coefficient and has a range from 0 to 1. The arbitrary limit of reliability is 0.7, and reliability above 0.8 is considered high or very high if it is above 0.9. The ZOK scale showed very high reliability (α=0.959) and the reliability of its subscales ranges from 0.902 for the Safety subscale to 0.825 for the Reliability subscale (Table 8).

Table 8. Reliability of the SIC scale and its subscales

Reliability	Cronbach's alpha (α)	Number of items (N)
SIC	0,959	22
Tangibility	0,855	4
Reliability	0,825	5
Responsibility	0,861	4
Security	0,902	4
Empathy	0,832	5

Descriptive statistical indicators

As already mentioned, satisfaction with insurance companies is expressed as the average of the sum of all 22 items of this scale with a range from 1 to 5, where a higher score indicates greater satisfaction. Satisfaction on the subscales of the SIC scale (tangibility, reliability, responsibility, safety and empathy) is also expressed as the average of the sum of the items that make up those subscales and has a theoretical range from 1 to 5.

The obtained research results showed that the general satisfaction with insurance companies in Serbia is above average and amounts to AS=3.50, SD=0.733 (Table 9).

When it comes to the subscales of the SIC scale, the highest satisfaction was obtained for the dimension Tangibility (AS=3.75, SD=0.783), followed by the dimensions Security, Responsibility, Reliability and the lowest satisfaction was obtained with the dimension Empathy (AS=3.42, AS= 0.844). It should be emphasized that the expression of all five dimensions is above the theoretical average, which indicates above average satisfaction with aspects of insurance company services (Chart 1)..

Table 9. Expression of satisfaction with insurance companies

Scale-subscale	MIN	MAX	AS	SD
SIC	1	5	3,50	0,733
Tangibility	2	5	***3,75***	0,783
Reliability	2	5	3,46	0,767
Responsibility	1	5	3,48	0,857
Security	1	5	3,55	0,826
Empathy	1	5	3,42	0,844

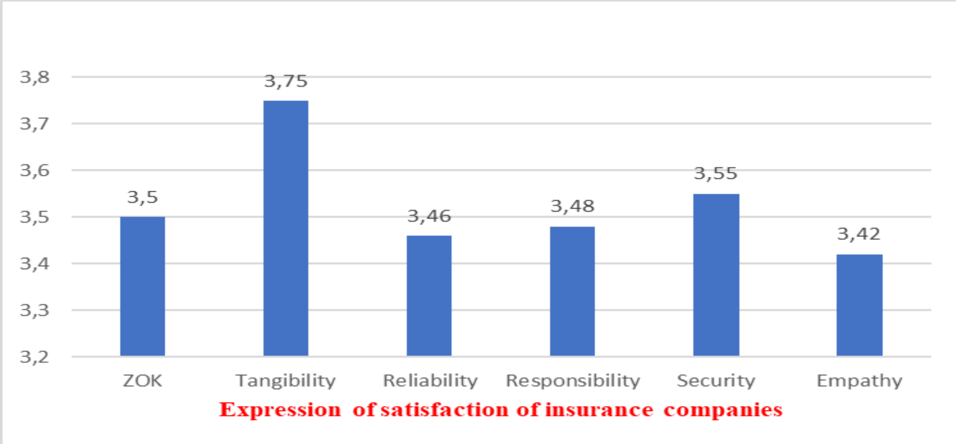

Chart 1. Expression of satisfaction with insurance companies

Differences in the expression of ZOK in relation to the sex of the respondents

In addition to the examination of respondents' global satisfaction with insurance companies, the research also examined the differences in the expression of ZOK in relation to the sociodemographic characteristics of the respondents: gender, age, level of education, place of residence.

When it comes to the gender of the respondents (Table 10), statistically significant differences in the expression of satisfaction with insurance companies were not confirmed, both at the level of the entire SIC scale and its dimensions. Somewhat higher satisfaction with insurance companies was confirmed among female respondents at the level of the entire SIC scale and dimensions tangibility, reliability and responsibility, while higher satisfaction with security and empathy was confirmed among male respondents. These differences in expression are minimal and did not show statistical significance.

Table 10. Differences in the expression of ZOK in relation to the sex of the respondents

Scale-subscale	Pol	AS	SD	t	p
SIC	Man	3,46	0,555	-0,628	0,531
	Female	3,55	0,912		
Tangibility	Man	3,67	0,711	-1,222	0,224
	Female	3,85	0,866		
Reliability	Man	3,41	0,776	-0,824	0,412
	Female	3,53	0,758		
Responsibility	Man	3,44	0,620	-0,635	0,527
	Female	3,54	1,100		
Security	Man	3,55	0,720	0,052	0,959
	Female	3,54	0,950		
Empathy	Man	3,48	0,578	0,774	0,441
	Female	3,35	1,107		

df=112;

Differences in the expression of SIC in relation to the age of the subjects

When we talk about the age of the respondents (Table 11), statistically significant differences in the expression of satisfaction with insurance companies were confirmed for the SIC scale as a whole (F=5.593, p=0.005) and the dimensions Tangibility (F=10.075, p=0.000), Reliability (F =8.810, p=0.000), Responsibility (F=5.586, p=0.005) at the level significance of p<0.01 and the Empathy dimension (F=4.016, p=0.021) at the significance level of p<0.05.

Subsequent analysis (LSD) confirmed that respondents aged 56 to 65 show significantly lower global satisfaction with insurance companies (SIC), as well as lower satisfaction with the tangibility and empathy of insurance companies compared to younger respondents (25-35 years and 35-55 years).

When it comes to the Reliability dimension, subsequent analysis confirmed that respondents aged 36 to 55 (AS=3.68, SD=0.791) show significantly higher satisfaction with the reliability of insurance companies compared to respondents aged 25 to 35 and respondents aged from 56 to 65 years. On the Responsibility dimension, it was confirmed that respondents aged 36 to 55 years (AS=3.68, SD=0.937) show significantly higher satisfaction with the responsibility of insurance companies compared to respondents aged 56 to 65 years (AS=3.04, SD =0.743).

Table 11. Differences in the expression of SIC in relation to the age of the respondents

Scale-subscale	Age	AS	SD	F	p
SIC	25-35	3,56	0,416	**5,593**	**0,005****
	36-55	3,64	0,811		
	56-65	3,08	0,563		
Tangibility	25-35	4,15	0,598	**10,075**	**0,000****
	36-55	3,82	0,841		
	56-65	3,21	0,373		
Reliability	25-35	3,28	0,529	**8,810**	**0,000****
	36-55	3,68	0,791		
	56-65	3,00	0,624		
Responsibility	25-35	3,35	0,348	**5,586**	**0,005****
	36-55	3,68	0,937		
	56-65	3,04	0,743		
Security	25-35	3,60	0,528	2,701	0,072
	36-55	3,66	0,921		
	56-65	3,21	0,682		
Empathy	25-35	3,52	0,513	**4,016**	**0,021***
	36-55	3,54	0,929		
	56-65	3,00	0,688		

*df=2; p<0,01**; p<0,05*;*

Differences in the expression of SIC in relation to the respondents' education

When we talk about the level of education of the respondents (Table 12), statistically significant differences in the expression of satisfaction with insurance companies were confirmed by the SIC scale as a whole (F=3.874, p=0.024) and its dimensions Safety (F=3.822, p=0.025) and Empathy (F=4.765, p=0.010). All three obtained differences are significant at the significance level of p<0.05.

Subsequent analysis showed that respondents with a university degree show significantly lower global satisfaction with insurance companies, but also lower satisfaction with safety and empathy of insurance companies compared to respondents with a master's degree and compared to respondents with a doctorate degree.

Table 12. Differences in the expression of SIC in relation to the respondents' education

Scale-subscale	Education	AS	SD	F	p
SIC	Faculty	2,84	0,024	**3,874**	**0,024***
	Master's degree (MSc)	3,48	0,469		
	Doctor of Science (PhD)	3,58	0,804		
Tangibility	Faculty	3,75	0,977	0,712	0,493
	Master's degree (MSc)	3,92	0,545		
	Doctor of Science (PhD)	3,70	0,815		
Reliability	Faculty	3,47	0,548	0,718	0,490
	Master's degree (MSc)	3,30	0,725		
	Doctor of Science (PhD)	3,52	0,809		
Responsibility	Faculty	3,33	0,492	0,797	0,453
	Master's degree (MSc)	3,33	0,602		
	Doctor of Science (PhD)	3,55	0,961		
Security	Faculty	2,88	0,134	**3,822**	**0,025***
	Master's degree (MSc)	3,42	0,525		
	Doctor of Science (PhD)	3,66	0,906		
Empathy	Faculty	2,73	0,939	**4,765**	**0,010***
	Master's degree (MSc)	3,50	0,524		
	Doctor of Science (PhD)	3,51	0,870		

df=2; p<0,05;*

Differences in the prevalence of SIC in relation to the respondent's place of residence

In relation to the respondent's place of residence (Table 13), statistically significant differences in respondents' satisfaction with the work of insurance companies were confirmed for the SIC scale as a whole (F=6.052, p=0.001) and the Reliability dimension (F=5.258, p=0.002). Responsibility (F=12.222, p=0.000) and Empathy (F=7.011, p=0.000) at the significance level of p<0.01, as well as for the Security dimension (F=3.532, p=0.017) at the significance level of p<0.05.

Subsequent analysis, comparison by group, showed that at the level of the entire SIC scale, respondents residing in the region of Šumadija and Western Serbia (AS=3.95, SD=0.494) show significantly higher satisfaction with the services of insurance companies compared to respondents residing in Belgrade region or region of Vojvodina. In addition, a statistically significant difference in the expression of satisfaction with insurance companies was also confirmed among respondents residing in the region of Southern and Eastern Serbia (AS=3.65, SD=0.620), in which higher satisfaction was confirmed compared to respondents residing in the Belgrade region. When it comes to the Reliability dimension, subsequent analysis showed that respondents residing in the region of Šumadija and Western Serbia show significantly higher satisfaction with the reliability of insurance companies compared to respondents residing in the Belgrade region and Vojvodina region, but also that respondents residing in the region of South and People from Eastern Serbia show greater satisfaction with the reliability of insurance companies compared to respondents living in the Belgrade region.

Table 13. Differences in the expression of SIC in relation to the respondent's place of residence

Scale-subscale	Place of residence	AS	SD	F	p
SIC	Belgrade	3,10	1,095	**6,052**	**0,001****
	Vojvodina	3,44	0,451		
	Šumadija and Western Serbia	3,95	0,494		
	Southern and Eastern Serbia	3,65	0,620		
Tangibility	Belgrade	3,58	1,129	0,829	0,481
	Vojvodina	3,77	0,642		
	Šumadija and Western Serbia	3,95	0,594		
	Southern and Eastern Serbia	3,71	0,743		
Reliability	Belgrade	3,17	1,097	**5,258**	**0,002****
	Vojvodina	3,31	0,642		
	Šumadija and Western Serbia	3,92	0,589		
	Southern and Eastern Serbia	3,67	0,467		
Responsibility	Belgrade	2,71	1,237	**12,222**	**0,000****
	Vojvodina	3,55	0,480		
	Šumadija and Western Serbia	3,95	0,497		
	Southern and Eastern Serbia	3,75	0,692		
Security	Belgrade	3,17	1,274	**3,532**	**0,017***
	Vojvodina	3,55	0,677		
	Šumadija and Western Serbia	3,95	0,497		
	Southern and Eastern Serbia	3,58	0,525		
Empathy	Belgrade	2,90	1,053	**7,011**	**0,000****
	Vojvodina	3,38	0,491		
	Šumadija and Western Serbia	3,96	0,509		
	Southern and Eastern Serbia	3,57	1,051		

*df=3; p<0,01**;p<0,05*;*

Similar results were obtained after the application of the subsequent analysis for the Responsibility dimension, as respondents living in the Belgrade region (AS=2.71, SD=1.237) showed significantly lower satisfaction with the responsibility of insurance companies compared to all other respondents. On the Security dimension, it was confirmed that respondents residing in the region of Šumadija and Western Serbia (AS=3.95, SD=0.497) show significantly higher satisfaction with security compared to respondents residing in the Belgrade region (AS=3.17, SD= 1,274).

Finally, related to the Empathy dimension, the subsequent analysis confirmed that respondents residing in the Belgrade region (AS=2.90, SD=1.053) show significantly lower satisfaction with the empathy of insurance companies compared to all other respondents. In addition, on this dimension, it was confirmed that respondents residing in the region of Šumadija and Western Serbia (AS=3.96, SD=0.509) show significantly higher satisfaction with this aspect of the offer of insurance companies compared to respondents residing in the region of Vojvodina (AS =3.38, SD=0.491).

Differences in the expression of SIC in relation to the marital status of the respondents

When it comes to the marital status of the respondents (Table 14), statistically significant differences in the expression of satisfaction with insurance companies were confirmed for the SIC scale as a whole (F=2.773, p=0.045) and the dimensions Tangibility (F=3.114, p=0.019) and Security (F=2.806, p=0.043) significantly at the significance level of p<0.05 as well as for the dimension Responsibility (F=4.711, p=0.004) significantly at the significance level of p<0.01.

Table 14. Differences in the expression of SIC in relation to the marital status of the respondents

Scale-subscale	Maritial status	AS	SD	F	p
SIC	Single/Unmarried	3,85	0,565	**2,773**	**0,045***
	Married/Community	3,40	0,773		
	Divorced	3,36	0,000		
	A widower	4,00	0,000		
Tangibility	Single/Unmarried	4,15	0,417	**3,114**	**0,029***
	Married/Community	3,64	0,845		
	Divorced	3,50	0,000		
	A widower	4,25	0,000		
Reliability	Single/Unmarried	3,60	0,779	0,642	0,589
	Married/Community	3,41	0,796		
	Divorced	3,60	0,000		
	A widower	3,80	0,000		
Responsibility	Single/Unmarried	3,90	0,598	**4,711**	**0,004****
	Married/Community	3,35	0,887		
	Divorced	3,25	0,000		
	A widower	4,50	0,000		
Security	Single/Unmarried	4,00	0,538	**2,806**	**0,043***
	Married/Community	3,43	0,886		
	Divorced	3,50	0,000		
	A widower	3,75	0,000		
Empathy	Single/Unmarried	3,68	0,730	1,378	0,253
	Married/Community	3,36	0,893		
	Divorced	3,00	0,000		
	A widower	3,80	0,000		

*df=3; p<0,01**;p<0,05*;*

Differences in the expression of SIC in relation to the monthly income of the respondents

When we talk about the monthly income of the respondents (Table 15), statistically significant differences in satisfaction with insurance companies were confirmed for the SIC scale as a whole (F=3.589, p=0.031) and the dimensions Reliability (F=3.421, p=0.036) and Responsibility (F=4.697, p=0.011) significantly at the significance level of p<0.05, as well as the Security dimension (F=6.600, p=0.002) significantly at the significance level of p<0.01.

Subsequent analysis showed that on all dimensions of the scale of satisfaction with insurance companies, as well as on the total score of the entire SIC scale, respondents who are single show significantly higher satisfaction with the quality of insurance company services compared to respondents who are married or cohabiting. In addition, according to the results of the subsequent analysis on the Responsibility dimension, it was confirmed that respondents who are widows (AS=4.50, SD=0.720) show significantly higher satisfaction with the responsibility of insurance companies compared to respondents who are divorced (AS=3.25, SD=0.000) and in relation to respondents who are married or cohabiting (AS=3.35, SD=0.000).

Table 15. Differences in the prevalence of SIC in relation to the respondents' monthly income

Scale-subscale		AS	SD	F	p
SIC	50,000 to 60,000 rsd	3,68	0,000	**3,589**	**0,031***
	More than 60,000 rsd	3,44	0,743		
	I don't want to say	4,14	0,437		
Tangibility	50,000 to 60,000 rsd	3,75	0,000	1,788	0,172
	More than 60,000 rsd	3,71	0,812		
	I don't want to say	4,25	0,267		
Reliability	50,000 to 60,000 rsd	4,00	0,000	**3,421**	**0,036***
	More than 60,000 rsd	3,40	0,754		
	I don't want to say	4,00	0,855		
Responsibility	50,000 to 60,000 rsd	4,00	0,000	**4,697**	**0,011***
	More than 60,000 rsd	3,40	0,859		
	I don't want to say	4,25	0,535		
Security	50,000 to 60,000 rsd	2,75	0,000	**6,600**	**0,002****
	More than 60,000 rsd	3,51	0,806		
	I don't want to say	4,38	0,668		
Empathy	50,000 to 60,000 rsd	3,80	0,000	1,918	0,152
	More than 60,000 rsd	3,37	0,878		
	I don't want to say	3,90	0,107		

*df=2; p<0,01**; p<0,05*;*

Differences in the expression of SIC in relation to the work status of the respondents

When it comes to the work status of the respondents (Table 16), no statistically significant differences were confirmed in the expression of satisfaction with insurance companies, both for the SIC scale as a whole and for its five dimensions. This is not surprising considering that the sample of respondents is uneven in terms of employment status, and that more than 95% of respondents are employed, while only 4 respondents are retired (N=4).

Subsequent analysis showed that respondents who did not want to disclose their monthly income showed significantly higher global satisfaction with insurance companies, but also greater satisfaction with the reliability and responsibility of insurance companies compared to respondents who have incomes greater than 60,000 dinars. On the Security dimension, according to the results of the subsequent analysis, it was confirmed that respondents who do not want to reveal their monthly income (AS=4.38, SD=0.668) show significantly higher satisfaction with the security of insurance companies compared to respondents with a monthly income of 50,000 to 60,000 dinars (AS=2.75, SD=0.000) and respondents with incomes greater than 60,000 dinars (AS=3.51, SD=0.806).

Greater expression of SIC, i.e. greater satisfaction on all dimensions of the scale of satisfaction with insurance companies, was obtained among employed respondents compared to pensioners, whose satisfaction was lower. These are minimal differences that did not show statistical significance.

Table 16. Differences in the expression of SIC in relation to the work status of the respondents

Scale-subscale		AS	SD	T	p
SIC	Employed	3,52	0,740	1,406	0,163
	Pensioner	3,00	0,000		
Tangibility	Employed	3,77	0,791	1,305	0,195
	Pensioner	3,25	0,000		
Reliability	Employed	3,49	0,770	1,781	0,078
	Pensioner	2,80	0,000		
Responsibility	Employed	3,50	0,867	1,148	0,254
	Pensioner	3,00	0,000		
Security	Employed	3,57	0,835	1,353	0,179
	Pensioner	3,00	0,000		
Empathy	Employed	3,44	0,856	1,017	0,312
	Pensioner	3,00	0,000		

df=112;

Discussion of results

The general goal of this research was to examine the satisfaction of respondents from Serbia with insurance companies. The research sample included 112 respondents, of both sexes, of different ages and levels of education, of different material, marital and work status.

For the purposes of the research, a scale of satisfaction with insurance companie (SIC) and a questionnaire on the sociodemographic characteristics of the respondents were created. The items of the SIC scale, 22 of them, are grouped into five dimensions: tangibility, reliability, responsibility, security and empathy. The scale itself, as well as its dimensions, showed high or very high reliability as measured by Cronbach's alpha coefficient.

The results obtained from the research confirmed that the respondents' satisfaction with insurance companies is above average. Respondents showed the highest satisfaction in relation to Tangibility and Safety of insurance companies, and then in relation to Responsibility and Reliability, while the lowest satisfaction was obtained for the Empathy dimension. The Tangibility dimension refers mainly to the visual aspect of the business of insurance companies, such as the equipment and arrangement of offices and physical accessibility to clients. Empathy as a dimension of satisfaction with the quality of insurance company services refers to paying individual attention to each individual client, as well as meeting and recognizing the client's needs and problems.

In addition to the examination of global satisfaction with insurance companies, this research also examined the existence of differences in the expression of SIC in relation to the sociodemographic characteristics of the respondents: gender, age, level of education, place of residence, marital status, amount of monthly income and work status of the respondents. The obtained results showed that in relation to the gender and working status of the respondents, there are no statistically significant differences in the expression of satisfaction with the services of insurance companies.

When it comes to the respondents' passion, statistically significant differences in the expression of SIC were confirmed for the scale of satisfaction with insurance companies, as well as its dimensions Tangibility, Reliability, Responsibility and Empathy. A subsequent analysis, comparing groups, confirmed that respondents aged 56 to 65 show significantly lower global satisfaction with insurance companies (SIC), as well as lower satisfaction with the tangibility and empathy of insurance companies compared to younger respondents (25-35 years and 35- 55 years). When it comes to the Reliability dimension, subsequent analysis confirmed that respondents aged 36 to 55 show significantly higher satisfaction with the reliability of insurance companies compared to respondents aged 25 to 35 and respondents aged 56 to 65. On the Responsibility dimension, it was confirmed that respondents aged 36 to 55 show significantly greater satisfaction with the responsibility of insurance companies compared to respondents aged 56 to 65.

In relation to the level of education of the respondents, it is important to note that only university students participated in the research, and that almost two-thirds of the entire research sample consisted of respondents with the title of Doctor of Science. The obtained findings showed that there are differences in the expression of satisfaction with insurance companies on the Security and Empathy dimensions, as well as on the overall average of the entire SIC scale, and subsequent analysis showed that respondents with a university degree show significantly lower global satisfaction with insurance companies, but also lower satisfaction with security and by the empathy of insurance companies in relation to respondents with a master's degree and respondents with a doctorate degree.

When it comes to the respondent's place of residence, statistically significant differences in the expression of satisfaction with insurance companies were confirmed for the ZOB scale as a whole and the dimensions Reliability, Responsibility, Security and Empathy. Subsequent analysis showed that at the level of the entire SIC scale, respondents residing in the region of Šumadija and Western Serbia show significantly higher satisfaction with the services of insurance companies compared to respondents residing in the Belgrade region or the Vojvodina region. When it comes to the Reliability dimension, subsequent analysis showed that respondents residing in the region of Šumadija and Western Serbia show significantly higher satisfaction with the reliability of insurance companies compared to respondents residing in the Belgrade region and Vojvodina region, but also that respondents residing in the region of South and People from Eastern Serbia show greater satisfaction with the reliability of insurance companies compared to respondents living in the Belgrade region.

Similar results were obtained after the application of the subsequent analysis for the Responsibility dimension, as respondents living in the Belgrade region showed significantly lower satisfaction with the responsibility of insurance companies compared to all other respondents. On the Security dimension, it was confirmed that respondents residing in the region of Šumadija and Western Serbia show significantly higher satisfaction with security compared to respondents residing in the Belgrade region. Finally, related to the dimension of Empathy, the subsequent analysis confirmed that respondents living in the Belgrade region show significantly lower satisfaction with the empathy of insurance companies compared to all other respondents. In addition, on this dimension, it was confirmed that respondents residing in the region of Šumadija and Western Serbia show significantly greater satisfaction with this aspect of the offer of insurance companies compared to respondents residing in the region of Vojvodina.

When we talk about the marital status of the respondents, it is important to note that three quarters of the entire research sample consists of respondents who are married or cohabiting, so it cannot be said that the sample is uniform in relation to this socio-demographic characteristic. The obtained results showed that there are statistically significant differences in the expression of satisfaction with insurance companies on the dimensions Tangibility, Responsibility and Security, as well as on the overall average of the entire scale of ZOB. Subsequent analysis showed that on all dimensions SIC scale, respondents who are single show significantly higher satisfaction with the quality of insurance company services compared to respondents who are married or cohabiting. In addition, according to the results of the subsequent analysis on the Responsibility dimension, it was confirmed that respondents who are widowed show significantly higher satisfaction with the responsibility of insurance companies compared to respondents who are divorced and compared to respondents who are married or cohabiting.

When we talk about the monthly income of the respondents, according to the obtained results, statistically significant differences in the expression of satisfaction with insurance companies were confirmed for the dimensions Reliability, Responsibility, Security and the overall average of the scale of satisfaction with insurance companies. Subsequent analysis showed that respondents who did not want to disclose their monthly income showed significantly higher global satisfaction with insurance companies, but also greater satisfaction with the reliability and responsibility of insurance companies compared to respondents who have incomes greater than 60,000 dinars. On the Security dimension, according to the results of the subsequent analysis, it was confirmed that the respondents who do not want to reveal the amount of their monthly income show significantly higher satisfaction with the security of insurance companies compared to respondents with monthly incomes of 50,000 to 60,000 dinars and respondents with incomes greater than 60,000 dinars.

CONCLUSION

The aim of this research was to examine user satisfaction with the services of insurance companies through different dimensions of service quality. The results indicate that users are generally satisfied with the services they receive, with certain aspects rated higher, while others are perceived with some reservations. The greatest satisfaction was expressed in the domain of tangibility of services, which includes the arrangement of offices, physical accessibility and visual aspects of business, as well as the feeling of security and trust in the services provided. These findings suggest that visual and infrastructural factors play a significant role in user perception. On the other hand, the least satisfaction was observed in the domain of empathy, which indicates the need for greater focus on individual approach to users and understanding of their needs. These results can be useful to insurance companies in shaping strategies to improve customer experience, especially in areas where there is room for improvement. The research findings confirm the importance of reliability and safety in the perception of the quality of insurance services. Although the respondents initially had certain expectations regarding individual quality dimensions, the results show that factors such as the tangibility of services and the ability to compare offers also play a significant role in user decision-making. Insurance companies can use these findings to improve their services, especially in segments where customers have expressed lower levels of satisfaction. Personalization of services, improvement of communication with clients and better adaptation of the offer to the needs of different user groups can contribute to increasing loyalty and trust in insurance institutions. Also, the research results point to the need for continuous monitoring of user satisfaction in order to recognize changes in user expectations and needs in a timely manner. The implementation of digital tools for the evaluation of user experience could significantly improve the process of collecting feedback and enable faster adaptation of services to market trends. This research contributes to a better understanding of the factors that influence user satisfaction with insurance and can serve as a basis for further research and improvement of services in this sector. Future research could be focused on a deeper analysis of the specific needs of user segments, as well as on examining the impact of new technologies on the perception of the quality of insurance services.

DECLARATIONS OF INTEREST STATEMENT

The authors affirm that there are no conflicts of interest to declare in relation to the research presented in this paper.

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ATTITUDES AND KNOWLEDGE OF THE INHABITANTS OD SERBIA ABOUT ARTIFICIAL INTELLIGENCE AND ITS TECHNOLOGIES

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ABSTRACT

This study provides a new perspective on trust in artificial intelligence (AI), examining people's attitudes toward trust in the use of AI systems in particular. The aim of this study is to examine attitudes and to know what are the advantages and disadvantages of artificial intelligence (AI). Also, in addition to the empirical part, this paper also deals with theoretical knowledge about artificial intelligence, which is the basis of the existing literature. For the purposes of this research, the authors created a survey based on secondary sources. The survey was conducted on the entire territory of Serbia. The subject of this work is the examination of the attitudes and knowledge of the inhabitants of Serbia about artificial intelligence as well as its technologies, which focuses on a deeper understanding of the perceptions and attitudes of the public in Serbia about artificial intelligence.

Keywords: Artificial intelligence, user attitudes and perception, technological integration, impact of AI on the labor market and research.

INTRODUCTION

In the field of IT, which is constantly evolving, artificial intelligence (AI) is gaining importance because it provides interaction with necessary information and services (Gökçearslan, Tosun, & Erdemir, 2024). In today's era, AI has a larger number of processes, such as learning, decision-making, reasoning, understanding the direction in which individuals are involved in order to obtain new necessary information that AI enables them, and therefore it is becoming increasingly important in business. So today, a larger number of organizations in different business segments are actively integrating or thinking about merging artificial intelligence (AI) into their business (Füller, Hutter, Wahl, Bilgram, & Tekic, 2022). So, this is the time when artificial intelligence (AI), with its admixtures, provides its decisions and is present in our lives every day and is certainly becoming a part of every person or company. The trend is reflected in how individuals form their preferences with the help of AI applications. Telecommunications, engineering, consumer, healthcare, pharmaceutical and educational institutions are among the first to implement AI technology (Perifanis, & Kitsios, 2023). Therefore, the authors Karaman and Goksu (Karaman, & Göksu, 2024), emphasized that the combination of AI and chatbots is important because it has led to extreme changes in the education sector, adopting a large number of applications that have been successfully implemented. In the sphere of education in larger areas, learning platforms have been adapted to improve the educational experience of students, automated processes that provide teachers with the process of student progress as well as the ability to recognize students and thus monitor their progress. The application of AI in educational institutions is important because its implementation represents a reengineering of traditional teaching methods and improves the overall learning ecosystem (Mabuan, 2024). The growth of digitalization and the adoption of AI has changed the business world in the environment (Javaid, Haleem, Singh, Suman, & Gonzalez, 2022). So, AI in modern conditions affects the way an organization works, in the sphere in which corporate strategy will be implemented (Kraus, et al., 2022). Artificial intelligence (AI) is considered a branch of computer science that is implemented to simulate intelligent behavior in computers with the aim of imitating and ideally improving human behavior (Naqvi, 2020). It has a significant impact in the fields of engineering, mechanical engineering, medicine, and other technologies, and therefore has an impact on education because with the help of machine learning systems and algorithms, it contributes to many solutions. The application of artificial intelligence is not always at the forefront of everyday life, it has an impact on various aspects of people's lives as we routinely interact with AI applications.

Artificial intelligence (AI) is becoming increasingly present in academia and education, using technology as a primary and significant component (Giray, Jacob, & Gumalin, 2024). With the implementation of the effect of AI applications such as ChatGPT, learning becomes applicable because it allows easier overcoming of obstacles in unfamiliar material (Karaman, & Göksu, 2024). Learning systems are designed to improve the user experience in learning, automated assessment systems that allow teachers to assess what has been learned, as well as facial recognition systems that offer insight into student behavior can be seen as different algorithmic applications of artificial intelligence in education, all of which aim to improve users in acquiring new skills (Remian, 2019). The application of artificial intelligence (AI) in almost all spheres is growing, and for this reason, new innovative capabilities are being adopted and directed in this context (Gansser, & Reich, 2021). Many companies are adopting artificial intelligence (AI) for a different group of tasks, for example: medical concerns, stock trading, the role of trust in artificial intelligence systems and aggregates plays the most significant role (Maslej, et al., 2023). It is known that artificial intelligence (AI) operates with the help of algorithms, which are part of the technique, the so-called "rational search for standardized means or practices for achieving already defined results" (Lindebaum, Glaser, Moser, & Ashraf, 2022). The technique can exploit the basic advantages of companies that rely on the value itself and are the basis of organizational activities as well as support the implementation of strategy (Rindova, & Martins, 2023). Companies that aim to have a competitive advantage with the application of artificial intelligence (AI) run the risk of concealing the decision of interested future customers (van Houwelingen, & Stoelhorst, 2022). It is important to align the tool (AI) with the necessary goals, values and the impact that it can have on trust in the agendas of artificial intelligence adopted by supra-actors (Gabriel, 2020), as well as researchers in various fields of research, such as morality (Malle, 2016), transparency (Xu, Benbasat, & Cenfetelli, 2014), explainability (Rai, 2020) and the concept of artificial intelligence (Cunneen, et al., 2020). For example, after interacting with ChatGPT, a GPT-based chatbot created by OpenAI, users with conservative political views expressed the belief that ChatGPT was embedded in OpenAI's bias against conservative views (Mitchell, 2023). For this reason, Sam Altman, CEO of OpenAI, has highlighted this issue as one of the most pressing challenges they face in developing their AI agents (Vincent, 2023). AI technologies have been implemented to perform economic tasks with greater care and reliability than humans (Balasubramanian, Ye, & Xu, 2022). AI technologies have proven themselves in performing repetitive, well-defined tasks that follow specific protocols (Berente, Gu, Recker, & Santhanam, 2021). However, the current form of AI is limited in handling unformulated, unstructured, higher-level tasks (Brynjolfsson, & McAfee, 2014), and this is because it lacks human creativity in generating novel answers to unknown problems (Wilson, & Daugherty, 2018). The application of AI requires that this tool be properly aligned with human needs, goals, and values (Russell, 2019). Empirical work has shown that AI alignment is of great concern to the general public (Zhang, et al., 2021). Given the impact of AI agents on people's lives, the United Nations and many AI practitioners and scholars have expressed concern about the limited research on AI alignment (Future of Life Institute, 2017) and have called for more work on how AI can be aligned with "shared global values" (Microsoft, 2023). Rapid technological advances in organizations, especially the growing adoption of artificial intelligence (AI) technologies in the workplace, have created an urgent need for scholars and practitioners to rethink the future of work and workplace dynamics (Balasubramanian, Ye, & Xu, 2022; Brynjolfsson, Liu, & Westerman, 2022; Iansiti, & Lakhani, 2020). Most scholars believe that AI has an impact because of its capabilities in conducting data analysis and making statistical predictions, which is a result of better accuracy in solving certain problems that require more information related to organizational management (Tong, Jia, Luo, & Fang, 2021), not to mention the threat that human resource managers may be threatened in terms of expressing their views (Köchling, & Wehner, 2020; Lee, 2018). Research based on artificial intelligence (AI) provides evidence of the application of algorithms, where people follow algorithmic advice and apply it (You, Yang, & Li, 2022). Namely, there are strong reasons to be pessimistic about AI outperforming its own data analytics "game" due to the long-known cognitive limitations of humans in making statistical predictions compared to algorithms (Dawes, 2008) and the constant technological improvement of AI capabilities (Lee, 2018).

Based on knowledge about artificial intelligence The research topic "Attitudes and knowledge of Serbian citizens on artificial intelligence and its technologies" focuses on a deeper understanding of the perceptions and attitudes of the public in Serbia on artificial intelligence (AI). Research objectives: Examination of general knowledge about artificial intelligence - To determine how familiar Serbian citizens are with the basic concepts, applications and terminology related to AI. Analysis of attitudes and perceptions about artificial intelligence - To investigate how Serbian citizens perceive AI in the context of ethical and social issues, as well as their views on possible benefits and risks. Consideration by demographic characteristics: To analyze how attitudes towards artificial intelligence differ among different demographic groups (gender, age, education, employment), Education and information - Identifying gaps in knowledge about AI can help in designing educational programs and awareness-raising campaigns. Preparing for technological change - Understanding citizens' attitudes can help companies and organizations better prepare for the introduction of AI technologies, adapt their products and services to the needs and expectations of users. Social adaptation - Monitoring attitudes and perceptions can facilitate social adaptation to the rapid technological changes brought about by AI, helping to reduce resistance and fear of new technologies. Acceptance and education - To assess the level of acceptance of AI technologies in society and the need for additional education or information on this topic. Research reasons: Lack of data - There is a need for systematic research in order to obtain a clear picture of the attitudes and knowledge of the inhabitants of Serbia about AI, given the rapid technological progress in this area.

In accordance with the research objectives, the following hypotheses were defined: Primary hypothesis: H0: Respondents have knowledge of artificial intelligence (AI). While the auxiliary ones: H1: Respondents use AI in everyday life, H2: Respondents are satisfied with the achievements that AI enables them. H3: Respondents believe that AI can improve work efficiency. In the research process, there were certain limitations that arose from the models themselves, but due to the conclusion that the expected response was not obtained. For the above reason, the authors adapted the questionnaire for this research. Namely, this method of data collection has its positive sides, such as reducing costs, reducing the possibility of influencing the interviewer to respond to the user, and convenience for people. The statistical program SPSS version 26 was used to process the data.

THE SAMPLE OF RESPONDENTS

The reliability of the measurement scale was checked using Cronbach's alpha (α). The obtained Cronbach's alpha coefficient (α = 0.845) indicates a high level of reliability and internal consistency, as it exceeds the recommended threshold of 0.8. Therefore, the questionnaire responses and respondents' ratings can be considered reliable for further analysis.

RESEARCH RESULTS

The research was conducted on a sample of 123 respondents, citizens of the Republic of Serbia, from various demographic categories. The age distribution of the sample includes respondents under 18 years (2.4%), those aged 19–25 years (57.7%), 26–50 years (35.0%), and over 50 years (4.9%) (Table 1). The average age of respondents is 29 years. Given that the majority of participants belong to the 19–50 age group (92.7%), the findings primarily reflect the attitudes of younger and middle-aged adults. The inclusion of respondents under 18 and over 50, despite their lower representation, provides additional insights into generational differences in AI perception. However, for a more precise analysis, future research could focus specifically on the 18–50 age group, where AI adoption and its impact on professional and daily activities are most pronounced.In the social sciences, samples larger than 30 are often considered sufficient for basic statistical analyses, especially when using a normal data distribution (eg, the central limit theorem). Cronbach's alpha coefficient (α = 0.845) shows that there is a high level of reliability of the questionnaire, which means that the obtained data are consistent and valid for further analysis. Similar studies on attitudes and perceptions often use samples of 100 to 300 respondents, especially when the goal is to examine general trends and perceptions in the population. For example, a study by Masley et al. (2023) used a sample of 110 respondents to analyze the perception of AI technologies, and the results were statistically valid.

Descriptive sample analysis

The results of the descriptive sample analysis with frequency (absolute and relative - percentage) in relation to gender show that there were more men 64 (52%) than women (48%). The structure of respondents in relation to age shows that there were a maximum of 71 respondents aged 19-25 (57.7%) and 35% of respondents aged 26 to 50, while the youngest (2.4%) and oldest respondents (4.9%) had the lowest number. In relation to the region where they live, the most are from the region of Šumadija and Western Serbia (32.5%), AP Vojvodina (23.6%) and Belgrade and its surroundings (22%), while the least are from Kosovo and Metohija (3.3%). There were more students than others and more unemployed than employed (65%). In the descriptive analysis of the sample, it is stated that the majority of respondents were students (65%) and that there were more unemployed than employed individuals. This demographic structure is particularly relevant for the study of attitudes toward artificial intelligence (AI), as students and younger individuals generally have greater exposure to AI technologies through education and digital platforms. Additionally, unemployed respondents may have a distinct perspective on AI's impact on the labor market, automation, and job opportunities. By analyzing these groups, the study provides insights into how AI is perceived by those who are entering or seeking to enter the workforce, making their opinions crucial for understanding future trends in AI adoption and its socio-economic implications.

Table 1. Structure of the sample according to demographic characteristics

Respondent categories	N = 123	Frequency	Percent
Gender	Male	64	52.0
	Female	59	48.0
Age	Up to 18 years	3	2.4
	from 19-25 years old	71	57.7
	from 26-50 years old	43	35.0
	over 50 years	6	4.9
Region where they live	Belgrade and surroundings	27	22.0
	Šumadija and Western Serbia	40	32.5
	Southern and Eastern Serbia	23	18.7
	Vojvodina	29	23.6
	Kosovo and Metohija	4	3.3
Student	not a student	43	35.0
	student	80	65.0
Employed	unemployed	80	65.0
	employee	43	35.0

Analysis of respondents' responses

The sample is not representative, although statistically it belongs to the group of large samples (N>50), but with a non-homogeneous structure and a very different number of respondents in relation to categories (groups), which is why the obtained results should be used with caution in generalizing conclusions.

The reliability of the measurement scale was checked using Cronbach's alpha α. Cronbach's alpha coefficient is good ($\alpha = 0.845 > 0.8$), which indicates a high level of reliability and internal consistency, which is why the responses obtained on the questionnaire and the respondents' ratings can be safely trusted for further analysis.

Analysis of respondents' responses

Respondents answered 21 questions in three areas: (1) general knowledge about artificial intelligence (4 questions), (2) practical applications of artificial intelligence (5 questions), and (3) attitudes and perceptions about artificial intelligence (12 questions) on a five-point Likert scale with answers ranging from 1-5. Respondents' responses to answers ranging from 1-5 were assigned appropriate scores from 1-5, and the weighted scores for each respondent were summed, the scores for all areas were summed, and an overall average score on artificial intelligence was derived. The mean scores of the respondents' responses are shown as the arithmetic mean (M) ± standard deviation (SD), as a measure of dispersion that also shows the spread of individual scores. Respondents rated general knowledge about artificial intelligence with an average score of 3.80±0.67 (Table 2), which is significantly higher than the average summary score for all answers on artificial intelligence (3.49±0.5). Most respondents (99%) have heard of artificial intelligence and rated it highly (4.46), but for the key question of how much they know about artificial intelligence, the average summary score is significantly lower (3.61±0.97) with a greater dispersion of individual scores up to one score (according to SD). More than half of the 73 respondents (59.4%) stated that they know or absolutely know about artificial intelligence, as opposed to 10.6% of respondents who do not know or know nothing at all about artificial intelligence.

Table 2. Mean values of respondents' ratings on general knowledge of artificial intelligence

Questions	N=123	M	SD	Min.	Max.
How often do you hear the term "artificial intelligence"		**4.46**	0.64	2	5
How much do you know about artificial intelligence		**3.61**	0.97	1	5
In your opinion, is artificial intelligence when Google can predict what you will type in the search box		**3.82**	1.09	1	5
In your opinion, is machine learning the same as artificial intelligence		**3.31**	1.09	1	5
General knowledge about artificial intelligence		**3.80**	**0.67**	**1.25**	**5.00**
Average summary score for artificial intelligence		**3.49**	**0.50**	**1.86**	**4.71**

The practical application of artificial intelligence was rated with an average score of 3.31±1.00 (Table 3), which is in line with the average summary score for all responses on artificial intelligence (3.49±0.5). Most respondents (27%) use artificial intelligence in everyday life occasionally or often, 12.2% very often, while only 13.8% have never used artificial intelligence. 47.9% use it often or very often at work, while 37.4% do not use it at work or very rarely. Artificial intelligence is used on average for up to an hour at most (41.5%), up to three hours a day (31.7%) and up to eight hours a day (11.4%). Of the artificial intelligence tools or technologies, ChatGPT is used the most (83.7%). Most users (68.3%) are satisfied with the results of using artificial intelligence tools.

Table 3. Mean values of respondents' ratings on the application of artificial intelligence

Questions	N=123	M	SD	Min.	Max.
How often do you hear the term "artificial intelligence"		**3.04**	1.23	1	5
How much do you know about artificial intelligence		**3.06**	1.37	1	5
In your opinion, is artificial intelligence when Google can predict what you will type in the search box		**3.33**	1.14	1	5
In your opinion, is machine learning the same as artificial intelligence		**3.81**	0.57	1	7
General knowledge about artificial intelligence		**3.83**	0.88	1	5
Average summary score for artificial intelligence		**3.31**	**1.00**	**1.00**	**5.00**
How often do you hear the term "artificial intelligence"		**3.49**	**0.50**	**1.86**	**4.71**

Based on the presented results, it can be concluded that the inhabitants of Serbia are very well acquainted with the basic concepts, applications and terminology of artificial intelligence (3.80 ±0.67), while the practical application of artificial intelligence in everyday life and work is significantly lower (3.31±1.00) with a larger dispersion of individual scores. Attitudes and perceptions about artificial intelligence were rated with an average score of 3.43±0.5 (Table 4), which is in line with the average summary score for all responses about artificial intelligence (3.49±0.5). In order to summarize all the ratings of attitudes in the same direction, the oppositely defined questions (1) were first decoded, asking whether they agree with the well-known sentence "People will lose their jobs because of artificial intelligence", to which the majority disagreed (79.7%) and 76.4% of respondents to the question (2) whether the description in the introduction to the questionnaire is too futuristic. Most respondents agree that artificial intelligence will not cause people to lose their jobs and that artificial intelligence is a real present and future, but 81.3% of respondents believe that some limits should be set regarding the use of artificial intelligence (4.20±1.06). Respondents expressed very consistent views, also with high scores, on the following questions: 77.2% of respondents believe that with the development of artificial intelligence, some jobs will become more important (3.89±1.01), that artificial intelligence will improve their work efficiency in their current or future profession (3.84±0.98) and, which is very important for the introduction of new artificial intelligence technologies in all branches of the economy, 68.3% of respondents stated that artificial intelligence will become an integral part of all industries (3.76±1.09).

On the other hand, 64.3% of respondents claim that artificial intelligence has the potential to improve our daily lives (3.58±1.11) and believe that artificial intelligence can affect our privacy and security (3.73±1.13), but with a greater spread of individual ratings by an average of over one rating.

Respondents were also in a dilemma about whether artificial intelligence can have ethical (moral) dilemmas (3.28) and whether artificial intelligence will reach the level of human consciousness (2.34) with a large gap of individual ratings of over one rating (SD=1.25). In contrast to undecided attitudes on these issues and partial agreement with only 3.3% of respondents that artificial intelligence could replace all jobs, such as kindergarten (1.26±0.65), 95.1% of respondents unanimously support the opposite view that artificial intelligence cannot replace all jobs.

Table 4. Mean values of attitudes towards artificial intelligence

Questions N=123	M	SD	Min.	Max.
Do you think that artificial intelligence can improve work efficiency in your current or future profession?	3.84	0.98	1	5
Do you agree with the famous sentence "People will lose their jobs because of artificial intelligence"	4.03	1.14	1	5
Do you think that artificial intelligence could replace all jobs, such as a teacher?	1.26	0.65	1	4
In your opinion, will some jobs become more important with the development of artificial intelligence?	3.89	1.01	1	5
Google CEO Sundar Pichai claimed that artificial intelligence would transform humanity more as a species than electricity and fire.	3.20	1.13	1	5
Do you think that artificial intelligence has the potential to improve our daily lives?	3.58	1.11	1	5
Do you think that artificial intelligence can affect our privacy and security?	3.73	1.13	1	5
Do you believe that artificial intelligence will reach the level of human consciousness?	2.34	1.25	1	5
Do you think that artificial intelligence can have ethical (moral) dilemmas?	3.28	1.25	1	5
Do you think it is important to set certain boundaries regarding the use of artificial intelligence?	4.20	1.06	1	5
Do you think artificial intelligence will become an integral part of all industries?	3.76	1.09	1	5
Is the previous text in the questionnaire description too futuristic?	4.04	1.26	1	5
Attitudes and perceptions of artificial intelligence	**3.43**	**0.50**	**2.00**	**4.67**
Average summary score for artificial intelligence	**3.49**	**0.50**	**1.86**	**4.71**

Based on the results presented, it can be concluded that the attitudes and perceptions of the inhabitants of the Republic of Serbia regarding artificial intelligence are relatively good, which is confirmed by the average summary score (3.49±0.5). The level of knowledge about artificial intelligence and citizens' awareness of the necessity of its application can facilitate social adaptation to rapid technological changes, while reducing resistance and fear of the introduction of new technologies, as well as strengthening the belief that artificial intelligence has the potential to improve our everyday lives, positively affect our privacy and security. In addition to social adaptation, in the economic sphere, citizens of Serbia believe that artificial intelligence will improve their work efficiency in their current or future profession, that it is a real present and future, that it can replace certain jobs, but they are of the same opinion that artificial intelligence cannot replace all jobs and that certain limits should be set regarding the use of artificial intelligence. Understanding citizens' attitudes towards artificial intelligence contributes to better preparations of companies and organizations of all sectors of the economy for the introduction of new technologies into their technological, production or service process for the management and organization of business processes. Citizens believe that artificial intelligence will become an integral part of all industries, used to optimize production, analyze the market and predict consumer needs. In addition to the economy, the strategy for the development of artificial intelligence in Serbia also includes the public sector to improve the work of public administration to improve the efficiency of public services, improve healthcare and transport, as key areas for the application of artificial intelligence in the public sector.

Analysis of attitudes towards artificial intelligence in relation to demographic groups

The analysis of attitudes towards artificial intelligence in relation to different demographic groups (gender, age, employment, location) was carried out using the T-test for independent samples to compare differences in mean values for categorical variables with two categories (gender and employment) and analysis of variance (ANOVA) to compare differences in categorical variables with more than two categories with an additional post hoc multiple comparison test (LSD).

The comparison of response frequencies in relation to demographic groups of respondents was carried out using the Chi-square test "Crosstabs" (Table 4). The results of the Chi-square test show the frequency of ratings of attitudes towards artificial intelligence, which range from sufficient to excellent and that there are no statistically significant differences in relation to all demographic groups. This conclusion stems from the fact that in all groups the frequency is similar, that the lowest for ratings is sufficient and excellent, and that the attitudes of the majority of citizens are rated good and very good, which range from 25-75%. On average, for all demographic groups, the frequency of ratings of sufficient and excellent is only 4% and 3%, while the frequency of ratings of good and very good is 50% and 42%, respectively.

Table 5. Frequency of ratings of attitudes towards artificial intelligence in relation to demographic groups

Demographic group (number/%)		Attitudes towards artificial intelligence 2	3	4	5	Total	η^2	p
Gender	Male gender	4	28	29	3	64	3.876	0.275
		6.3%	43.8%	45.3%	4.7%	100%		
	Female gender	1	34	23	1	59		
		1.7%	57.6%	39.0%	1.7%	100%		
Age	Under 18 years	0	1	2	0	3	6.215	0.718
		0.0%	33.3%	66.7%	0.0%	100%		
	19 - 25 years old	2	40	26	3	71		
		2.8%	56.3%	36.6%	4.2%	100%		
	26 - 50 years	2	19	21	1	43		
		4.7%	44.2%	48.8%	2.3%	100%		
	over 51 years	1	2	3	0	6		
		16.7%	33.3%	50.0%	0.0%	100%		
Employment	unemployed	3	40	34	3	80	0.241	0.971
		3.8%	50.0%	42.5%	3.8%	100%		
	employed	2	22	18	1	43		
		4.7%	51.2%	41.9%	2.3%	100%		
Location	Belgrade and surroundings	1	13	11	2	27	9.378	0.670
		3.7%	48.1%	40.7%	7.4%	100%		
	Šumadija and Western Serbia	2	16	20	2	40		
		5.0%	40.0%	50.0%	5.0%	100%		
	Southern and Eastern Serbia	2	13	8	0	23		
		8.7%	56.5%	34.8%	0.0%	100%		
	Vojvodina	0	17	12	0	29		
		0.0%	58.6%	41.4%	0.0%	100%		
	Kosovo and Metohija	0	3	1	0	4		
		0.0%	75.0%	25.0%	0.0%	100%		
Total		**5**	**62**	**52**	**4**	**123**		
		4.1%	**50.4%**	**42.3%**	**3.3%**	**100%**		

An examination of the differences in the mean values of citizens' opinions on artificial intelligence in relation to demographic groups (Table 6) also determined that there are no statistically significant differences in opinions between all demographic groups of citizens of the Republic of Serbia.

Table 6. Mean values of citizens' opinions on artificial intelligence in relation to demographic groups

Demographic groups		N	M	SD	t (F)	df	p
Gender	Male gender	64	3.48	0.54	1.154	121	0.251
	Female gender	59	3.38	0.45			
Employment	Unemployed	43	3.44	0.52	0.158	121	0.875
	employed	80	3.42	0.49			
Age	Under 18 years	3	3.58	0.25	0.435	3	0.728
	19 - 25 years old	71	3.41	0.48			
	26 - 50 years old	43	3.47	0.51			
	over 51 years	6	3.26	0.74			
Location	Belgrade and aurroundings	27	3.52	0.58	0.939	4	0.444
	Šumadija and Western Serbia	40	3.49	0.51			
	Južna i istočna Srbija	23	3.29	0.43			
	Vojvodina	29	3.40	0.46			
	Kosovo and Metohija	4	3.25	0.42			
Total		**123**	**3.43**	**0.50**			

M - arithmetic mean, SD - standard deviation, t - value, test statistic, F - value, ANOVA analysis statistic.

Below is a tabular presentation of descriptive statistics Frequency of respondents' responses to all questions.

Namely, below the question 'Is the previous text in the description of the questionnaire too futuristic?' refers to the introductory part of the questionnaire in which respondents are introduced to the basic concepts, current applications and possible future development of artificial intelligence. This part of the questionnaire was intended to provide context for further questions and to examine respondents' perceptions of the future of AI technologies. The detailed content of this description can be found in Annex 1.

Table 7. Descriptive statistics Frequency of respondents' responses to all questions[1]

Questions and answers		Frequency	Percentage	η^2	p
Is the previous text in the description of the questionnaire too futuristic	Absolutely yes	63	51.2	89.480	0.000
	Yes	31	25.2		
	Undecided	8	6.5		
	No	13	10.6		
	Absolutely not	8	6.5		
How often do you hear the term "artificial intelligence"	Rarely	1	0.8	97.325	0.000
	Occasionally	7	5.7		
	Often	50	40.7		
	Very often	65	52.8		

[1] **Note:** In the case of the same significance of differences in respondents' answers (p=0.000), the differences are greater for higher η2-values

Table 7. Descriptive statistics Frequency of respondents' responses to all questions - continued[2]

Questions and answers		Frequency	Percentage	η^2	p
Do you use artificial intelligence in your daily life	Never	17	13.8	12.569	0.014
	Rarely	24	19.5		
	Occasionally	34	27.6		
	Often	33	26.8		
	Very often	15	12.2		
Do you use artificial intelligence in your work	Never	24	19.5	14.764	0.005
	Rarely	22	17.9		
	Occasionally	18	14.6		
	Often	41	33.3		
	Very often	18	14.6		
How much do you use artificial intelligence every day	I don't use	16	13.0	63.301	0.000
	Less than one hour a day	51	41.5		
	Between one and three hours a day	39	31.7		
	Between three hours and eight hours a day	14	11.4		
	All day	3	2.4		
What AI tools or technologies do you use	ChatGPT	103	83.7	520.359	0.000
	Canva AI Art	5	4.1		
	Gemini	3	2.4		
	DALL-E	2	1.6		
	Jasper AI	2	1.6		
	Copilot	1	0.8		
	Prome AI	1	0.8		
Are you satisfied with the results you got using artificial intelligence tools	Absolutely not	3	2.4	83.707	0.000
	No	3	2.4		
	I'm not sure	33	26.8		
	Yes	57	46.3		
	Absolutely yes	27	22.0		
Do you think artificial intelligence can improve work efficiency in your current or future profession	Absolutely not	4	3.3	66.797	0.000
	No	6	4.9		
	I'm not sure	28	22.8		
	Yes	53	43.1		
	Absolutely yes	32	26.0		

[2] **Note:** In the case of the same significance of differences in respondents' answers (p=0.000), the differences are greater for higher η2-values

Table 7. Descriptive statistics Frequency of respondents' responses to all questions - continued[3]

Questions and answers		Frequency	Percentage	η^2	p
How much do you know about artificial intelligence	I don't know at all	5	4.1	66.715	0.000
	I don't know	8	6.5		
	I neither know nor do I know	37	30.1		
	I know	53	43.1		
	I absolutely know	20	16.3		
In your opinion, is it artificial intelligence that Google can predict what you will type in the search box	Completely false.	8	6.5	61.187	0.000
	Partially incorrect	4	3.3		
	I don't know, I have no opinion	25	20.3		
	Partially true	51	41.5		
	Absolutely correct	35	28.5		
In your opinion, is machine learning the same as artificial intelligence	Completely false.	9	7.3	60.618	0.000
	Partially incorrect	11	8.9		
	I don't know, I have no opinion	57	46.3		
	Partially true	25	20.3		
	Absolutely correct	21	17.1		
"People will lose their jobs because of artificial intelligence" - a sentence we hear more and more often. Do you agree with that	I completely disagree.	54	43.9	89.642	0.000
	I partially disagree	44	35.8		
	I don't know, I have no opinion	3	2.4		
	I partially agree	19	15.4		
	I completely agree	3	2.4		
Do you think artificial intelligence could replace all jobs, such as a teacher	I completely disagree	101	82.1	217.715	0.000
	I partially disagree	16	13.0		
	I don't know, I have no opinion	2	1.6		
	I partially agree	4	3.3		
In your opinion, will some jobs become more important with the development of artificial intelligence	I completely disagree	6	4.9	93.301	0.000
	I partially disagree	6	4.9		
	I don't know, I have no opinion	16	13.0		
	I partially agree	63	51.2		
	I completely agree	32	26.0		

[3] **Note:** In the case of the same significance of differences in respondents' answers (p=0.000), the differences are greater for higher η2-values

Table 7. Descriptive statistics Frequency of respondents' responses to all questions - continued[4]

Questions and answers		Frequency	Percentage	η^2	p
Google CEO Sundar Pichai has argued that artificial intelligence would transform humanity as a species more than electricity and fire	I completely disagree	13	10.6	47.528	0.000
	I partially disagree	12	9.8		
	I don't know, I have no opinion	53	43.1		
	I partially agree	28	22.8		
	I completely agree	17	13.8		
Do you think artificial intelligence has the potential to improve our daily lives	I completely disagree	10	8.1	64.439	0.000
	I partially disagree	9	7.3		
	I don't know, I have no opinion	25	20.3		
	I partially agree	58	47.2		
	I completely agree	21	17.1		
Do you think artificial intelligence can affect our privacy and security	I completely disagree	8	6.5	47.772	0.000
	I partially disagree	4	3.3		
	I don't know, I have no opinion	39	31.7		
	I partially agree	34	27.6		
	I completely agree	38	30.9		
Do you believe that artificial intelligence will reach the level of human consciousness	I completely disagree	43	35.0	29.154	0.000
	I partially disagree	27	22.0		
	I don't know, I have no opinion	27	22.0		
	I partially agree	20	16.3		
	I completely agree	6	4.9		
Do you think that artificial intelligence can have ethical (moral) dilemmas	I completely disagree	16	13.0	19.398	0.001
	I partially disagree	14	11.4		
	I don't know, I have no opinion	33	26.8		
	I partially agree	39	31.7		
	I completely agree	21	17.1		
Do you think it is important to set certain boundaries regarding the use of artificial intelligence	I completely disagree	5	4.1	102.894	0.000
	I partially disagree	5	4.1		
	I don't know, I have no opinion	13	10.6		
	I partially agree	37	30.1		
	I completely agree	63	51.2		
Do you think artificial intelligence will become an integral part of all industries	I completely disagree	7	5.7	56.553	0.000
	I partially disagree	8	6.5		
	I don't know, I have no opinion	24	19.5		
	I partially agree	52	42.3		
	I completely agree	32	26.0		

[4] **Note:** In the case of the same significance of differences in respondents' answers (p=0.000), the differences are greater for higher η2-values

It should also be pointed out that Artificial Intelligence (AI) is a technology that increasingly affects everyday life and business. Algorithms and machine learning enable AI systems to analyze data, recognize patterns and make decisions previously reserved exclusively for humans. In the future, AI could play a key role in job automation, medical diagnostics, education and many other fields. Some experts predict that AI will surpass human abilities in certain tasks, while others believe that it will remain just a tool in the hands of humans. The selection of AI tools in the survey was based on their popularity and widespread use at the time of the research. The listed tools, such as ChatGPT, Canva AI Art, Gemini, DALL-E, Jasper AI, and Copilot, were chosen because they represent different categories of AI applications, including text generation, image creation, and virtual assistants. The exclusion of a 'Other' option was a methodological decision aimed at ensuring data comparability and avoiding open-ended responses that could complicate statistical analysis. However, future research could incorporate an open-ended option to capture additional AI tools used by respondents. More than half of the respondents (51.2%) believe that the text in the description of the questionnaire is too futuristic. The term "artificial intelligence" is often heard, with 52.8% of respondents saying they hear it "very often" and 40.7% "often". When it comes to knowledge of AI, 43.1% of respondents stated that they "know" something about it, while 30.1% are in the middle ("neither know nor don't know"). 26.8% use AI "often", while 12.2% state that they use it "very often". In a business environment, 33.3% use AI "often", while 14.6% declare that they use it "very often". The most frequently used tool is ChatGPT (83.7%), while other tools are marginally represented. 46.3% of respondents believe that AI improves work results, while 22.0% are completely satisfied. 43.1% of respondents believe that AI can improve efficiency in their current or future profession. The survey questions were designed to be clear and easily understandable for respondents with different levels of familiarity with artificial intelligence. The question 'How much do you know about artificial intelligence?' aims to assess respondents' self-perceived knowledge of AI, without requiring specialized expertise. However, future studies could refine this question by specifying whether it refers to general knowledge, practical experience, or technical understanding. Similarly, the question 'Do you think some jobs will become more important with the development of artificial intelligence?' is formulated to capture respondents' perception of AI's impact on the job market. While the phrasing is straightforward, a more detailed version could specify whether it refers to new job roles emerging due to AI, changes in existing professions, or shifts in industry demand. To ensure clarity, future research could incorporate additional explanatory notes or examples within the survey to guide respondents in interpreting these questions correctly.

51.2% of respondents believe that it is important to set limits in the use of AI. 35% of respondents do not believe that AI will ever reach the level of human consciousness, while 16.3% believe that it is partially possible. 31.7% of respondents think that AI may have ethical dilemmas. 30.9% believe that AI can significantly affect privacy and security. 43.9% of respondents strongly disagree with the statement that people will lose their jobs because of AI, while 35.8% partially do not believe it. The majority of respondents (82.1%) believe that AI cannot completely replace professions such as teaching. 51.2% believe that some jobs will become more important with the development of AI. 47.2% of respondents believe that AI can improve everyday life. 26.0% of respondents believe that AI will become an integral part of all industries.

All p-values are: 0.000 or very small, indicating statistically significant differences, in respondents' responses. High η^2 values (eg 520.359 for the AI tools question) indicate that there is a large variability in responses and that some topics are particularly polarized. The research indicates a positive perception of AI, but also the existence of certain ethical and security dilemmas. Participants do not expect a complete loss of jobs, but believe that AI will change job roles and industries. Namely, high η^2 values indicate significant variability in responses, suggesting that some topics are particularly polarized among respondents. While sample size and structure can influence η^2 values, the obtained results reflect genuine differences in perceptions rather than purely methodological limitations. However, future research could aim for a more balanced sample distribution, particularly across different age groups and employment statuses, to ensure greater representativeness and minimize potential biases."

DISCUSSION OF RESULTS

The research results show that the inhabitants of Serbia have a relatively high level of awareness and knowledge about artificial intelligence (AI), but also that there are certain uncertainties and dilemmas regarding its application and ethical implications. Most respondents recognize the importance of artificial intelligence in modern society and its potential to improve business processes and everyday life. On the other hand, concerns have been raised regarding the privacy, security and ethics of using AI.

One of the key findings of the research is that more than half of the respondents have heard of the concept of artificial intelligence and that they often encounter it in their daily lives. However, when it comes to the level of knowledge, there were significant differences among the respondents, with only 16.3% of them stating that they fully understand AI and its technologies. This indicates the need for additional education and information for the general public about this area. Regarding practical application, the results show that 47.9% of the respondents use AI in their daily life, while 37.4% rarely or never use AI at work. The most commonly used tools are ChatGPT and related applications, which indicates their increasing availability and popularity. These data suggest that AI is increasingly integrated into everyday activities, but that there is still a gap in its application in professional settings. The perception of the impact of AI on employment shows interesting results. The majority of respondents (79.7%) do not believe that AI will cause mass job losses, while 77.2% believe that certain professions will become more important due to the development of AI. These findings show that Serbian citizens are not particularly pessimistic about the future of work in the context of the development of ICT, but still express the need to set certain limits in its use (81.3%). Regarding ethics and regulation, respondents were divided. While 51.2% believe that it is necessary to set clear rules for the application of AI, 31.7% of respondents believe that AI can have ethical dilemmas, and 30.9% believe that it can affect privacy and security. These results point to the need for further discussion of ethics and regulation in the field of artificial intelligence, in order to ensure its responsible use. The analysis of demographic groups showed that there are no significant differences in attitudes towards AI between genders, age groups and employed and unemployed respondents. This indicates that the perception of AI in Serbia is relatively uniform, regardless of demographic characteristics. In general, the results of the research confirm the basic hypothesis that the inhabitants of Serbia have a certain level of knowledge about artificial intelligence. Also, auxiliary hypotheses were confirmed, whereby the majority of respondents are satisfied with the achievements of AI and believe that they can improve work efficiency. However, the research also points to the need for further education and awareness of AI, as well as the development of regulations that will ensure its safe and ethical use.

CONCLUSION

AI technologies are of great help to employees as they gradually become more creative by generating new and useful ideas at work. Artificial intelligence AI has increased employee creativity and is increasingly present in all spheres of society. Therefore. the value created by artificial intelligence (AI) and people, the strengthening of human creativity (which is key to the new industrial revolution), and the unequal effects on human workers with different existing job skills — topics that deserve greater attention from scientists, practitioners and policymakers. Artificial intelligence is developing rapidly and raises key questions about the future of our society. Analyzing the advantages and disadvantages of artificial intelligence, it is clear that this technology carries enormous potential for positive impact, but also challenges that require careful management. The survey results show that Serbian residents are relatively well informed about artificial intelligence, but also that there is a certain level of uncertainty and concern regarding its application and ethical implications. Respondents generally recognize the importance of regulation and ethical guidelines for artificial intelligence, suggesting that there is a need for a broader discussion on how to best utilize the potential of artificial intelligence in society, while simultaneously reducing risks and negative impacts on people and the environment. While the IT sector is actively using artificial intelligence and is committed to its development and application, other professions are aware of its importance but are often insufficiently informed about the specific technologies, concepts and opportunities that artificial intelligence offers to improve their fields of work. Investment in education and awareness-raising among employees outside the IT sector is needed to better utilize the potential of artificial intelligence in different industries and areas in Serbia. Considering the rapid development of artificial intelligence, it is crucial for society to follow technological innovations in order to adequately respond to the new challenges and opportunities that AI brings. Although artificial intelligence is often presented as a threat, the reality is that it is still in development and that it will take a lot of time and effort before it can pose a real threat to humanity. The main hypothesis: H0: The respondents have knowledge about artificial intelligence (AI) is confirmed by this research, which is proven in table number 2. While the auxiliary ones are: H1: The respondents use AI in everyday life, which is proven in work because 47.9% of the respondents use it, while 37.4% do not use it in work or very rarely., H2: The respondents are satisfied with the achievements that AI enables them, which is confirmed in this research, because (68.3%) of the respondents are satisfied with the results that AI enables. H3: The respondents believe that AI can improve work efficiency, which is confirmed in this research, because artificial intelligence will improve their work efficiency in their current or future profession, which is rated with (3.84±0.98), which is proven in table number 3. The results of the research confirm this auxiliary hypothesis, where the respondents estimated that artificial intelligence will improve their work efficiency in their current or future profession with an average score of 3.84 (SD=0.98) (Table 4). Specifically, 69.1% of respondents agree or completely agree with this statement, while only 8.2% are unsure or disagree. These results indicate a dominantly positive perception of the impact of AI on work efficiency. However, it should be noted that there are certain differences in perceptions depending on the degree of involvement in AI technologies. For example, respondents who use AI tools more often in their daily life and work had statistically significantly more positive attitudes about its effectiveness. This correlation indicates that practical experience with AI technologies contributes to a more positive attitude towards their use. Additionally, the results show that 47.9% of respondents use AI tools in their daily lives, while 37.4% rarely or never use AI at work. This may indicate that, although there is a generally positive opinion about the potential of AI to improve work efficiency, its application in professional settings has not yet been fully realized. According to the quantitative data from the research, which confirms that the majority of respondents believe that AI will improve their work efficiency, but also that there are differences in perception depending on the degree of use of AI technologies.

The results of the survey show that, despite the relatively high level of awareness of AI, there are no significant statistical differences in the attitudes of respondents towards AI between different demographic groups, including gender, age, education and employment status. The analysis showed the following: Gender: Both men and women expressed a similar level of knowledge of AI and similar attitudes about its benefits and risks. Although a slightly higher number of men expressed positive attitudes about the use of AI, this difference is not statistically significant. Age groups: Respondents under 25 years of age showed a higher level of awareness and experience with AI tools, while those over 50 years of age expressed more reserved attitudes and more pronounced concerns about the ethical and security aspects of the use of AI. Employment: Employed respondents are more likely to point out that AI can improve efficiency in the workplace, while the unemployed are more skeptical about the impact of AI on the labor market. Regional differences: Respondents from urban areas use AI more often in their daily lives compared to those from rural areas, which may be due to different access to technology and digital infrastructure. Although the results indicate relatively uniform attitudes across the population, we recommend that future research include a larger and more diverse sample, in order to better understand possible differences in terms of industrial sector of employment, educational level and economic status of the respondents. Recommendations for future research: Focused sectoral research – Analyze how different industries (e.g. IT, healthcare, education) perceive and apply AI, with a particular focus on expectations and challenges in their implementation. Long-term attitude monitoring study – Investigate how attitudes towards AI change over time, especially in the context of rapid technological change and the increasing integration of AI into daily life. Qualitative analysis – In addition to quantitative data, it is recommended to conduct interviews and focus groups to gain a deeper understanding of respondents' attitudes and potential concerns regarding AI. Regional differences – Analyze attitudes in more detail in urban and rural areas, taking into account different levels of access to technology, education, and digital literacy. Ethical and legal dimensions of AI – Future research could focus on understanding the ethical dilemmas and legal frameworks related to AI, to ensure its responsible and safe application.

DECLARATIONS OF INTEREST STATEMENT

The authors affirm that there are no conflicts of interest to declare in relation to the research presented in this paper.

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Miroslav, V., Ikica, Z., Hrnić, B., & Vuković, V. (2025). Analysis of marine fuel oil purifier efficiency, chemical elements and compounds found in them. *STED Journal, 7*(1), 77-88.

ANALYSIS OF MARINE FUEL OIL PURIFIER EFFICIENCY, CHEMICAL ELEMENTS AND COMPOUNDS FOUND IN THEM

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ABSTRACT

Ensuring the proper operation of a ship's propulsion system necessitates the use of high-quality fuels. Several factors contribute to fuel quality, including the source of origin crude oil, refining methods, blending processes, and the quality of storage and distribution. Marine fuels must adhere to international standards such as ISO standards to be suitable for consumption on ships.

This article presents an analysis of over 6000 fuel samples obtained from two sample points within a purification system, conducted by independent laboratories. While all samples must meet the ISO 8217:2017 Standard for marine residual fuel before bunkering, this analysis focuses on elements with potentially harmful effects on marine engine systems. A comprehensive examination will be conducted, employing an inductive method to draw general conclusions about the current levels of abrasive impurities and other detrimental elements in fuels post-purification.

Specific attention will be given to elements like aluminium, silicon, vanadium, calcium, magnesium, lead, nickel, potassium, sodium, zinc, and phosphorus present in residual fuel oils. These elements, in certain forms or concentrations, pose challenges to marine engines. Testing conducted according to the IP 501 standard, utilizing inductively coupled plasma emission spectrometry, is essential to ensuring smooth engine operation and mitigating damages and associated costs caused by abrasive fines in the fuel oil.

Keywords: fuel treatment, fuel quality, abrasive fines, ISO standard.

INTRODUCTION

Fuel represents one of the most significant cost factors in operating a ship and is also the source of numerous operational issues, both direct and indirect. Several reasons contribute to this situation: the fluctuating cost of fuel due to geopolitical events, supply and demand dynamics, and regulatory changes; stringent environmental regulations dictating the permissible types of fuel, particularly concerning sulphur content and other requirements; technical challenges associated with the diverse properties and requirements of different fuels regarding storage, handling, and combustion; the imperative to improve fuel efficiency due to both cost and environmental concerns; and the risks inherent in the fuel supply chain, especially in high-risk areas where delays or interruptions in fuel delivery can impact ship schedules and incur additional costs.

In light of these factors, shipowners and operators continuously seek ways to mitigate the impact of fuel-related challenges through fuel management strategies, the adoption of new technologies, education, and regulatory compliance measures. Issues such as fuel contamination, compatibility, stability, and quality can lead to operational problems including engine failures, increased maintenance (and it costs), and reduced efficiency. A major concern among ship operators is the quality of fuel delivered to their vessels. Off-specification bunkers can lead to commercial losses and further costs if such fuels damage engines and their components.

Ensuring the efficiency of marine fuel purification requires proper sampling and detailed analyses of each element in the fuel.

MATERIAL AND METHODS OF WORK

The ISO 8217 (Vermeire, 2021) standard specifies the requirements (maximum or minimum limits) for petroleum fuels used in marine diesel engines and boilers before appropriate treatment onboard. It defines several categories of distillate fuels and residual fuels.

The primary objective of ship purification processes is the removal of contaminants such as water, impurities (sediment, rust, particles, etc.), and microbial agents from the fuel. To achieve this, methods including centrifugal separation, filtration, and settling are employed. The separator's effective throughput should match the diesel engine's maximum consumption, with an additional margin of approximately 18% (Latarche, 2021, p. 145). This ensures that the separated fuel oil can flow back from the daily tank to the settling tank. When properly treated, centrifugal separation is the most effective method for extracting these impurities from the fuel. When operating at optimal efficiency, ship purifiers can remove particles larger than 5 microns. Solid contaminants in marine fuels, such as aluminium and silicon, originate primarily from the cracking process in refineries (Fisher, & Meech, 2013).

The current ISO 8217:2017 standard introduced additional grades and reduced some limitations. This standard specifies fuel characteristic limits such as viscosity, density, cetane index/CCAI, sulphur, flash point, hydrogen sulphide, acid number, total sediment, carbon residue, cloud point, pour point, cold filter plugging point, appearance, water, ash, lubricity, vanadium, sodium, aluminium plus silicon (cat fines), calcium, and zinc (Chybowski, Myśków, & Kowalak, 2023). The focus of this article will be on these latter elements as they can damage the engine or reduce its efficiency.

There are numerous methods to detect elements in fuel, such as Particle Sizing using Scanning Electron Microscope (SEM) in conjunction with Energy Dispersive X-Ray Analysis (EDX). These methods are employed to check the size of different particles present in tested marine fuels. Depending on the laboratory, two different IP methods (IP 501 and IP 470) are commonly used (Khayal, 2019). Both methods are used to determine elements like aluminium, silicon, vanadium, nickel, iron, sodium, calcium, and zinc in residual fuel oil by ashing. IP 501 utilises fusion and inductively coupled plasma emission spectrometry (ICP-OES) and can determine an additional element, phosphorus. IP 470 uses fusion and atomic absorption spectrometry (AAS). The testing results are presented in Table 1.

Table1. Tested element and their range (IP 501 and IP 470)

Element	Range (mg/kg)
aluminium	5 to 150
silicon	10 to 250
vanadium	1 to 400
nickel	1 to 100
iron	2 to 60
sodium	1 to 100
calcium	3 to 100
zinc	1 to 70
phosphorus	1 to 60

Aluminium and silicon

Aluminium and silicon are typically found in residual fuel due to catalytic cracking during the crude oil refining process (Latarche, 2021). Commonly referred to as *cat fines*, these particles are very sharp, hard, and abrasive, posing significant risks to the main engine and its components. Cat fines can cause substantial damage to sensitive engine parts, such as fuel pumps, fuel injectors, cylinder liners, and piston rings (Vukičević, 2022). If excessive amounts of these abrasive impurities enter the engine, they can even lead to total engine failure. Major manufacturers of main engines recommend that cat fines be kept within a range of up to 10 mg/kg. If the concentration reaches 15 mg/kg, it is considered a warning level. The maximum permissible concentration of catalytic fines according to ISO standard 8217 (Draffin, 2012) is 60 mg/kg, so it is crucial for marine crews to reduce this value to below 10 mg/kg.

What is meaning in terms of a good fuel?

- It must not contain components which leave deposits that can affect the proper operation of the fuel treatment and injection system.
- The fuel must maintain stability under various operating conditions.
- It should atomize consistently, producing droplets of nearly uniform size.
- It must have predictable ignition and burning characteristics, particularly regarding pre-ignition and stable burning performance.
- The fuel must completely combust before the exhaust phase of the cycle begins.
- It should not contain corrosive elements that exceed the tolerance levels of the engine materials.
- It must be free from abrasive particles in amounts exceeding the engine manufacturer's specifications, even after treatment.

Ash

Ash content in fuel represents the quantity of inorganic, non-combustible material present. While certain ash-forming components exist naturally in crude oil, others result from refining processes or contamination during storage and distribution. For instance, vanadium occurs in crude oil and can reach concentrations of approximately 400 mg/kg in residual fuels. Other elements such as sodium, iron, and calcium are found in low concentrations in crude oil and refined residual fuel. However, elevated levels of these elements detected during marine fuel analysis typically indicate contamination (Fisher, & Meech, 2013).

Fuel contamination during storage and distribution can increase ash levels, with sodium potentially originating from seawater, iron from pipeline and tank rust, or from dust, dirt, and careless or intentional mixing with other substances. High ash content in fuel can cause post-combustion fouling of marine boilers and engines. Certain ash components, like vanadium and sodium, are corrosive and can damage engine exhaust valves, turbochargers, and boiler tubes through the formation of corrosive deposits.

Ash tends to adhere to piston rings and accumulate in piston ring grooves within the piston crown. This can cause the rings to seize, leading to excessive wear of both the rings and cylinder liners, and gas blow-by, resulting in scavenge fires. Ash accumulation on turbochargers can reduce their efficiency, and insufficient charge air results in poor combustion, generating additional carbon deposits that exacerbate the problem.

The presence of phosphorus, calcium, and zinc in fuels often signifies contamination with waste lubricating oils, particularly when these elements are detected together. However, if any of these elements are found in isolation in bunker fuel, it could indicate a different form of contamination. When vanadium is present alongside these elements in a non-particulate form, it cannot be reduced through mechanical treatment onboard. Consequently, if these elements are present in high concentrations in the fuel upon delivery, they will persist in the fuel even after combustion.

Water

Water is introduced into marine fuels usually due to poor housekeeping. The challenges faced by a ship's crew when receiving fuel deliveries with increased water levels are multifaceted and encompass various issues. These problems can include the formation of sludge in fuel tanks, blockage of filters, corrosion of fuel injection equipment, corrosion of exhaust valves, and fouling of turbochargers (ExxonMobil, 2017). The severity of these issues is influenced by factors such as the type of water present (seawater or freshwater), the design and heating capabilities of storage tanks, and the design and operation of onboard purifiers. Additionally, the density and viscosity of the fuel impact the effectiveness of settling tanks and purifiers in removing water. These challenges require careful consideration of multiple variables and may necessitate proactive measures to mitigate potential damage and disruptions to ship operations.

Ships equipped with properly designed settling tanks and well-maintained and operated separators can typically reduce water content to satisfactory levels before fuel injection into the main engine, even when the initial water content is as high as 3%.

Saltwater contamination can occur during fuel delivery due to several factors. These include contamination by the delivery barge (mixing seawater with the fuel during barge loading, barge voyage, or discharge), structural defects on the barge, or improper valve operations. Seawater can also enter ships' storage tanks from a mixture of ballast water or ingress of the sea through defective hatch covers and small plate fractures. One common cause of ballast water entering ships' fuel tanks is the corrosion of fuel tank sounding and vent pipes that pass-through ballast tanks. Seawater contamination of fuel raises significant concerns due to potential chemical reactions between sodium compounds in the water and vanadium compounds in the fuel during combustion. These reactions can result in the formation of corrosive ash, leading to high-temperature corrosion of exhaust valves. When vanadium and sodium oxidize during combustion, they tend to create semi-liquid, sticky salts with low melting points that adhere to exhaust valves. These sticky deposits not only corrode the valves and seats but also attract other combustion deposits, potentially causing mechanical damage.

To address this issue, engine manufacturers have introduced specialized alloys such as Nimonic steels with enhanced corrosion resistance. Additionally, they have designed exhaust valves to rotate, aiding in dislodging ash buildup and preventing repeated contact between the same valve and seat areas. Moreover, valve temperatures are carefully maintained below the threshold at which these ash compounds deposit. The sticking temperature of these corrosive ashes varies but is typically considered lowest when the ratio of vanadium to sodium is 3:1 (Fisher, & Meech, 2013).

Figure 1. Reconditioned exhaust valve (QuantiServ, 2024).

The metals in seawater contribute to the total ash content in fuel. High levels of sodium can form substantial amounts of ash on turbocharger grids and blades. If this ash is not removed by frequent water washing, the performance of the turbocharger will be impaired, leading to poor combustion and increased fouling. As mentioned earlier, saltwater contamination can be reduced by settling and centrifuging onboard. As a rough guide, 1% seawater contamination would contain approximately 100 mg/kg of sodium.

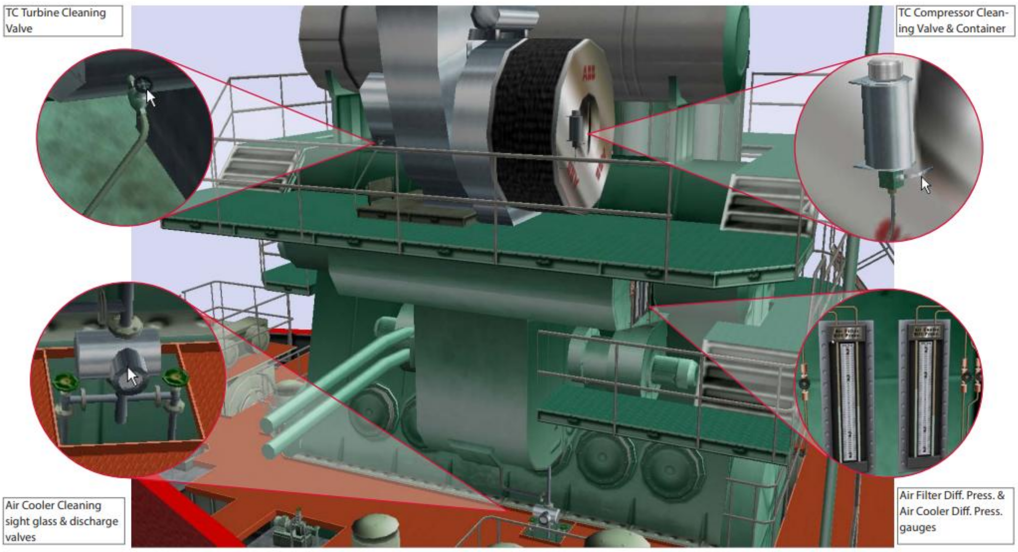

Figure 2. Turbocharger cleaning -compressor side (Transas Marine 2016 MAN B&W 6S60MC-C Diesel Engine – Tanker LCC. Trainee Manual pdf)

Freshwater infiltration into fuel systems on ships can occur through various scenarios, including delivery with fuel (bunkering), tank condensation, improper setting of purifiers, leaking steam heating coils, and rainwater ingress. While not as severe as seawater contamination, the presence of freshwater can still pose challenges. Emulsion formation and sludge issues may arise, potentially impacting fuel efficiency and system reliability. Regular monitoring and maintenance are crucial to mitigate these concerns and ensure optimal vessel performance.

Sulphur

Sulphur is naturally found in crude oils and, consequently, is present in residual fuels. Geographical variations in sulphur levels exist due to the diverse sulphur compositions in crude oils from different regions. Sulphur is associated with higher boiling point compounds and is therefore present at higher levels in residual fuel compared to distillates (Witherby, 2013).

During the combustion process, sulphur dioxide (SO_2) and sulphur trioxide (SO_3) are generated. Under specific engine conditions, such as excess air, temperature, and pressure, these gases undergo partial conversion into sulphuric acid and sulphurous acid. This conversion typically occurs when the gases reach temperatures below their respective dew points.

Sulphurous acid forms within a temperature range of 50°C to 60°C, while sulphuric acid forms within a range of 110°C to 150°C. These acids pose a risk of corrosion, particularly in the cooler regions of engines and boilers. This phenomenon is commonly referred to as “cold end corrosion”.

Sodium, Iron, Nickel, Magnesium, Lead and Potassium

Sodium is a metal found in crude oil from certain geographical areas, such as western Venezuela. It remains in the fuel after refining and not only contributes to the ash content but also forms compounds that lower the melting point of ash in the exhaust when combined with any existing sodium.

Iron present in fuel oil originates from various sources, including iron particles from pipelines, valves, and worn metal components. Additionally, rust contributes to the iron content. Iron from engine wear can also be found in any waste lubricating oil added to the fuel.

Nickel, an element originating from crude oil, serves as a key component for identifying oil samples. Despite treatment efforts, the content of sulphur, vanadium, and nickel remains unaltered. Therefore, two samples purportedly from the same oil source will exhibit closely aligned levels of sulphur, vanadium, and nickel if indeed they are from the same oil (Fisher, & Meech, 2013).

Magnesium originates from salts present in seawater. The presence of magnesium allows the determination of the proportion of sodium attributable to seawater.

Lead can be present if waste lubricating oil from gasoline engines using leaded gasoline has been added to the fuel.

The elements of calcium, nickel, potassium, and zinc in small quantities can be used to indicate the presence of used lubricants in the fuel supply.

RESULTS AND DISCUSSION

This article presents an analysis of over 6000 fuel samples (with IP501 method) obtained from two sample points within a purification system, conducted by independent laboratories. While all samples must meet the ISO 8217:2017 Standard for marine residual fuel before bunkering, this analysis focuses on elements with potentially harmful effects on marine engine systems.

Fuel samples were analysed from two sample points within ships’ purification system, at the purifier inlet and outlet. Samples were analysed for 15 different elements and compounds. The elements tested were: aluminium (Al), silicon (Si), calcium (Ca), iron (Fe), lead (Pb), magnesium (Mg), nickel (Nc), phosphorus (P), potassium (K), sodium (Na), vanadium (V), and zinc (Zn), while the compounds were: aluminium-silicon alloy (AlSi), water (H_2O), and ash. There were 5667 measurements for each inlet and outlet, for each parameter.

Efficiency of purification was calculated using the formula:

$$1 - \frac{\text{Outlet measurement value}}{\text{Inlet measurement value}} \qquad (1)$$

Only positive efficiency values were taken into account for further analysis, i.e. negative efficiency values (where the value measured at the outlet were higher than those at the inlet) were discarded, along with any efficiency values equal to zero (0).

The resulting efficiency values for each measurement were then grouped into categories (by 0.1 or 10%), averaged, and plotted onto a graph to visually estimate the normality of distribution. Each parameter then had a linear trendline estimated, according to the formula:

$$y = a \cdot x + b \qquad (2)$$

The linear trendability (R^2) value was also estimated for each parameter and trendline, indicating how well the trendline fits the data.

The Spearman Correlation Coefficient was used to assess the significance of relationship between measured elements. This non-parametric measure does not assume normal distribution of the data. The correlation analysis was conducted using Python's pandas library, which provides a function corr(method='spearman') for calculating this statistic.

RESULTS

The original dataset had 5668 separate inlet and outlet measurements for each element. After calculating efficiency for each measurement, according to equation 1 above, it was decided to consider only the efficiency values greater than zero in further study. The descriptive statistics are given in Table 1.

Table 1. Descriptive statistics of purification efficiency of elements tested (No – number of valid measurements; Min – minimum efficiency value recorded; Max – maximum efficiency value recorded; Mean – arithmetical mean of measured efficiency values; StD – standard deviation of measured efficiency values; Median – median value of measured efficiency values); Var – variance of measured efficiency values)

	Al	AlSi	Ash	Ca	Fe	Pb	Mg	Nc	P	K	Si	Na	V	H_2O	Zn
No	5305	5476	4609	3999	4725	38	1275	2797	591	1342	5202	4336	2488	2087	1409
Min	0.024	0.013	0.011	0.007	0.014	0.200	0.125	0.013	0.006	0.040	0.014	0.015	0.003	0.029	0.028
Max	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mean	0.640	0.640	0.225	0.458	0.425	0.785	0.772	0.188	0.635	0.721	0.669	0.271	0.108	0.471	0.610
StD	0.234	0.238	0.178	0.293	0.233	0.266	0.282	0.160	0.351	0.308	0.246	0.200	0.166	0.254	0.333
Med	0.667	0.667	0.180	0.400	0.393	1.000	1.000	0.143	0.500	1.000	0.667	0.222	0.057	0.446	0.500
Var	0.055	0.057	0.032	0.086	0.054	0.071	0.079	0.025	0.123	0.095	0.061	0.040	0.027	0.065	0.111

Negative efficiency values resulted primarily when the outlet measurement value (i.e. value after purification) was greater than the inlet value (the value before purification), implying higher concentration of that element after purification. In situation when the inlet measurement value was equal to 0, the equation (1) retuned an error (division by zero), and such values were likewise discarded. When the calculated efficiency value was equal to zero, it implied that both inlet and outlet values were identical, in which case there was no purification. Figure below shows discarded efficiency values per parameter measured according to category.

After plotting the efficiency values against the number of samples, it was apparent that the parameters could be grouped into four distinct groups according to the shape of the curve formed as well as general trendline equation and R^2 values. Figures 4 to 8 show the groups.

Group 1 includes aluminium (Al), aluminium-silicon alloy (AlSi), and silicon (Si). This group is characterised by an upward slope of the trendline and the relatively high to high R^2 values (ranging from 0.69 to 0.82) (Figure 4). These elements show the best purification results. Their mean and median efficiency values are fairly close together and relatively high (Table 1). They also had the lowest number of discarded efficiency values (Fig. 3).

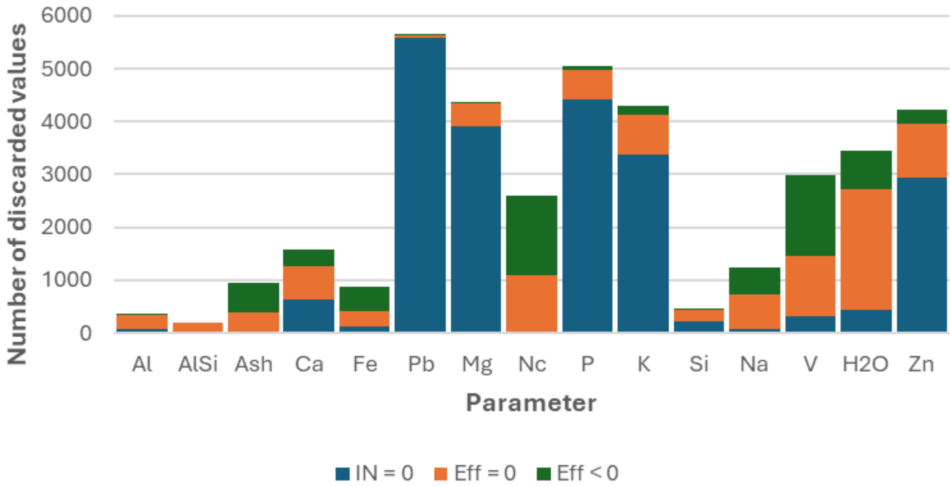

Figure 3. Representation of discarded efficiency values (IN = 0 – measurement at the inlet was equal to zero; Eff < 0 – calculated efficiency value was negative; Eff = 0 – calculated efficiency value was equal to zero)

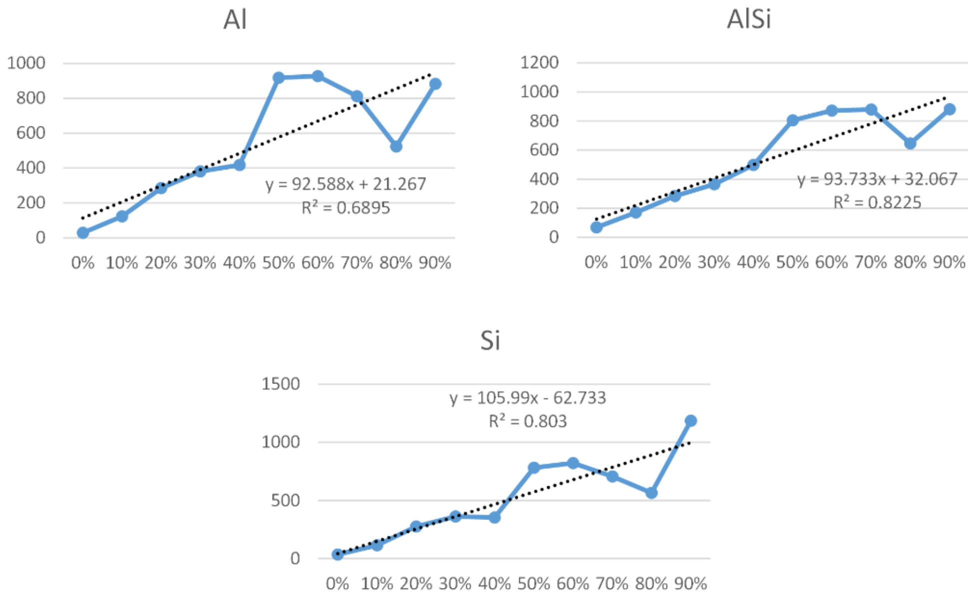

Figure 4. Parameters of Group 1 (X-axis – efficiency, Y-axis –number of samples)

Group 2 consists of Ash, sodium (Na), nickel (Nc), and vanadium (V), and the plots show a downward-sloping trendline and R^2 values lower than those of Group 1 (0.43 to 0.81). These elements had the highest number of measurements below 20% and generally had very low number of measurements above 50% (Fig. 5).

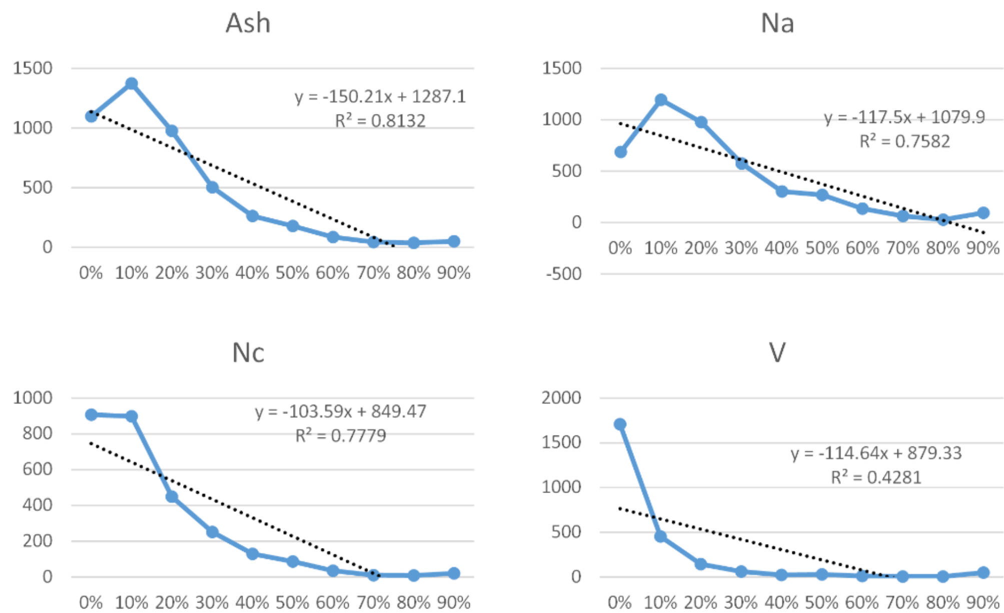

Figure 5. Parameters of Group 2 (X-axis – efficiency, Y-axis –number of samples)

Group 3 includes potassium (K), magnesium (Mg), phosphorus (P), lead (Pb), and zinc (Zn). The trendline has an upward slope, but not as pronounced as that of group 1, and R^2 values are in the low range (0.12 to 0.34). It is typical for this group to have evident peaks at 50% and 90% efficiency, with low values at 40% and 60 to 80% (Fig. 6). All elements of this group, apart from Zn, have the highest occurrence of efficiency values in the 90-100% range (which, in turn, increases the average and median efficiency values). They also had the highest number of discarded values, so that the efficiency calculation for lead (Pb) was done using just 38 valid entries (Table 1).

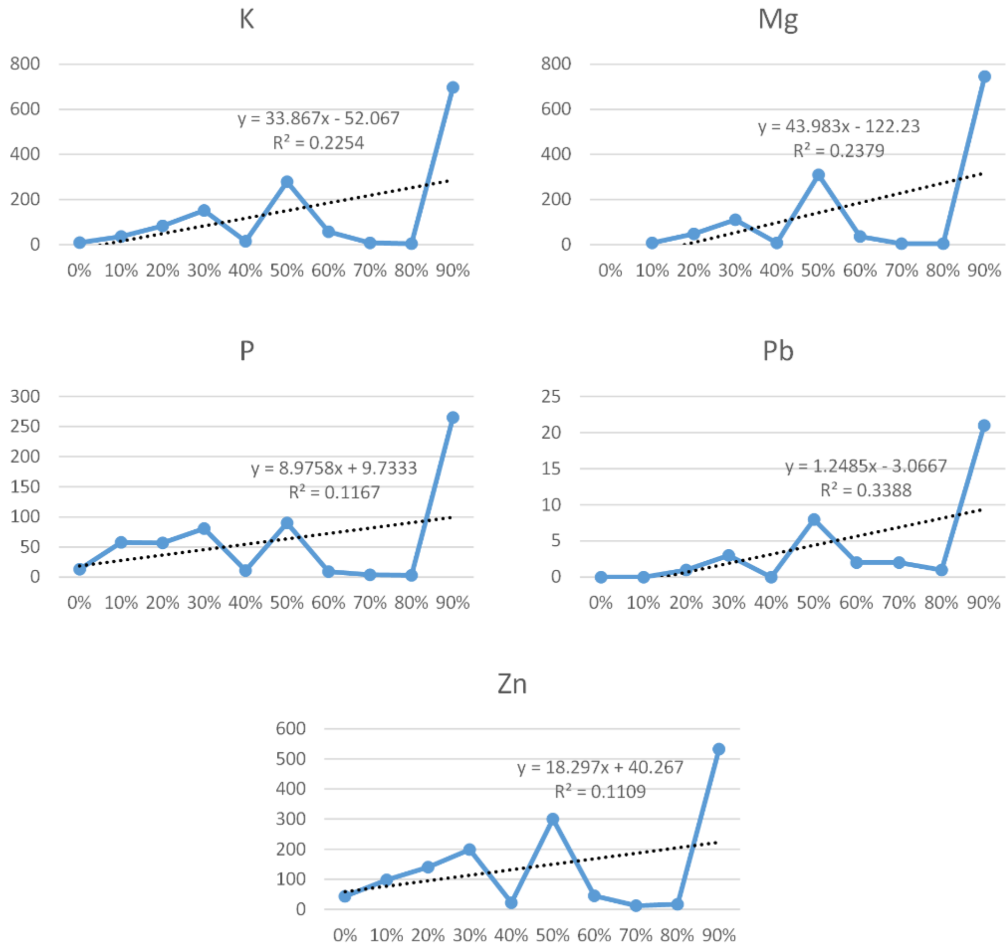

Figure 6. Parameters of Group 3 (X-axis – efficiency, Y-axis –number of samples)

Group 4 (calcium (Ca), iron (Fe), and water (H_2O)) shows a sharp increase in efficiency up to 20-30%, and pronounced reduction at 40%, with a sharp increase at 90%. This group has the lowest R^2 values (0.007 to 0.2), with downward sloping trendline.

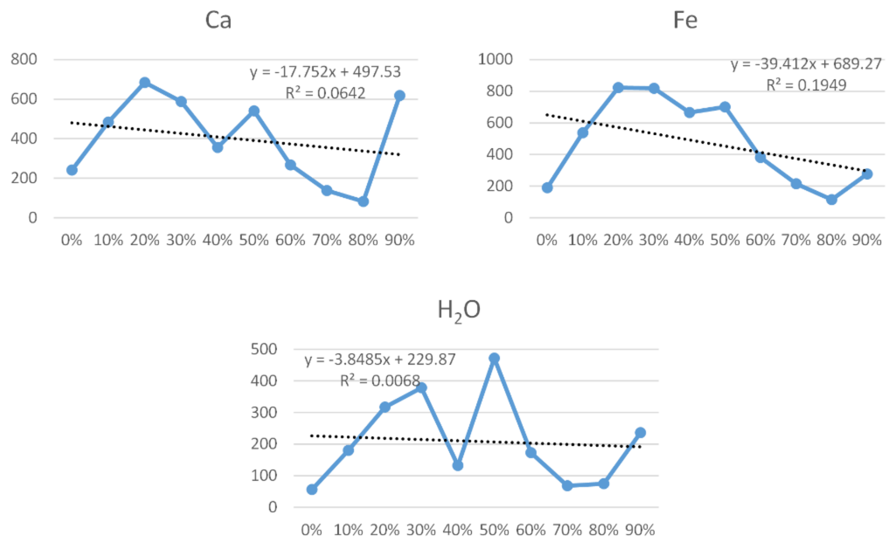

Figure 7. Parameters of Group 4 (X-axis – efficiency, Y-axis –number of samples)

Spearman Correlation Coefficient heatmap for the shows the strongest correlation between the group 1 elements (aluminium, silicon and aluminium-silicon alloy), ranging from 0.71 (Al-Si) to 0.92 (Al-AlSi) (Fig. 8). The lowest correlation (−0,27) was found between lead (Pb) and potassium (K), with negative correlation also recorded for lead and sodium (−0,06), vanadium (−0,03), and ash (−0,01).

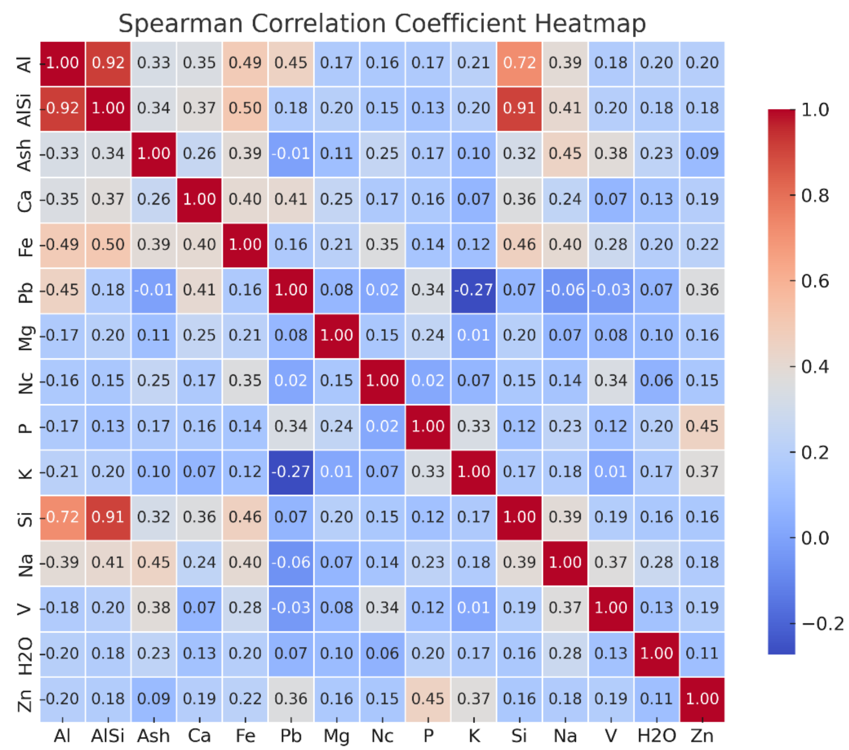

Figure 8. Spearman Correlation Coefficient heatmap

CONCLUSIONS

Measuring fuel elements is crucial for ensuring the smooth operation and longevity of main engines. By monitoring fuel purifier efficiency and the quantity of different fuel elements, engineers can detect abnormalities and react preventively before they escalate into major engine troubles. In this study, an in-depth analysis of marine fuel composition was conducted, focusing on the presence of 15 distinct elements that serve as indicators of impurities.

The findings revealed abrasive elements, particularly aluminium (Al), silicon (Si), and their combination (Al+Si), across the samples examined. Notably, it was observed that in more than 50% of the samples, there was effective elimination of these impurities, signifying a high efficiency of the ship's fuel separator system. This underscores the importance of rigorous monitoring and efficient filtration processes in maritime operations to ensure the quality and integrity of the fuel used. This, in turn, contributes to the reliable and smooth functioning of marine engines while mitigating the risk of abrasive wear and related operational challenges.

Among the elements categorized in the second group, namely ash, sodium (Na), nickel (Ni), and vanadium (V), a concerning trend emerged. It was observed that these elements exhibited a higher prevalence of samples with low efficiency in elimination, with rates reaching up to 30%. Conversely, a significantly smaller proportion of samples demonstrated efficient elimination of these elements. This highlights a potential area of concern regarding the effectiveness of the ship's fuel separator system in addressing these specific impurities.

Although certain elements are not present in every sample (as indicated by the number of analysed samples, e.g., Pb, P, etc.), IP methods allow for the measurement of a large number of elements, which can be of great benefit to marine engineers and the preventive maintenance of systems. This proactive approach not only reduces the risk of unexpected breakdowns but also optimizes engine performance and extends its operational lifetime.

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MODELING A PURIFICATION SYSTEM FOR EFFICIENT REMOVAL OF ABRASIVE IMPURITIES

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ABSTRACT

Aluminium and silicon particles in fuel known as “cat fines” are catalytic residues from the refinery process. They can cause mechanical damage to fuel pumps, injectors, piston rings and cylinder liners. They are very hard and highly abrasive, thus causing abrasive wear to main engine components. These impurities in marine fuel must be minimised to recommended levels. One of the main tasks of the fuel treatment plant on a ship is to separate solids and water from the fuel. Modern vessels are equipped with fuel separators which rotate at a high speed (more than 6,000 rev/min) producing centrifugal force and providing good separating effect even for small solid particles (Al+Si). Proper settling and regular drainage from the tanks, even when adequate filtration is applied, are not sufficient for proper fuel preparation. The quality of purifier operation varies over years because it is affected by a large number of factors. For the purpose of this paper, over twelve thousand fuel samples were analysed to determine the current efficiency of the purifiers and whether they can meet the stringent requirements of marine engine manufacturers. The data will be taken from a tanker ship, considering different operational scenarios. These scenarios are linked to the maximum possible fuel consumption on the ship during exploitation. Using the Simulink program for the system simulation, optimisation can be achieved in the operation of fuel separator. This optimization refers to the required amount of fuel and quality of separation, particularly concerning the removal of abrasive impurities.

Keywords: Abrasive wear, Cat fines, Purifier optimization, Ship automation & simulation.

INTRODUCTION

Modern ships in the merchant navy generally have two fuel separators, while passenger ships and ships powered by diesel electric can have one for each of the engines. The problem of catalytic impurities has not been a recent phenomenon. On the contrary, it dates back to the eighties of the last century. If these impurities enter the engine combustion chamber, the parts (surfaces) are prone to wear out. Additionally, cracks can occur in the cylinder liner and piston rings, which will cause a huge problem for the main engine.

Major marine engine manufacturers recommend that these impurities be less than 10 µm (Vukičević, Račić, & Ivošević, 2019). Nevertheless, if stuck in the cylinder liner or in the space between the groove of the ring and the piston ring itself, even a smaller amount of impurities along with poor lubrication can still lead to unwanted wear.

The costs that can arise in these situations range from several hundred thousand dollars to even over a million (Vukičević, Račić, & Ivošević, 2019). Therefore, it is necessary to develop a model that will credibly describe the given problem and indicate the way the process of fuel purification may be improved.

PROBLEMS WITH FUEL IMPURITIES AND PURIFIER EFFICIENCY (2018 - 2020)

The problems arising during fuel bunkering, fuel storage in the ship's tanks and during the entire process of entering the main engine are analysed here. The design of the tanks and the materials used for the construction will not be discussed because those would relate to increased investments by the company. Provided that fuel heating coils in the tanks work properly and that the engineers adjust the fuel temperature correctly, further improvement and upgrade of the system will not be the focus of our attention in this paper.

It should be noted that even when using very low sulphur fuel oil (VLSFO), problems can occur. In specific problems reported for marine fuel (Innospec technical bulletin [ITB], 2020), as many as 37% of cases are related to serious failures on the separators, along with other incidents reported during the use of the fuel. One of the problems leading to the wear of the surface layer on the cylinder liner was the one caused by cat fines.

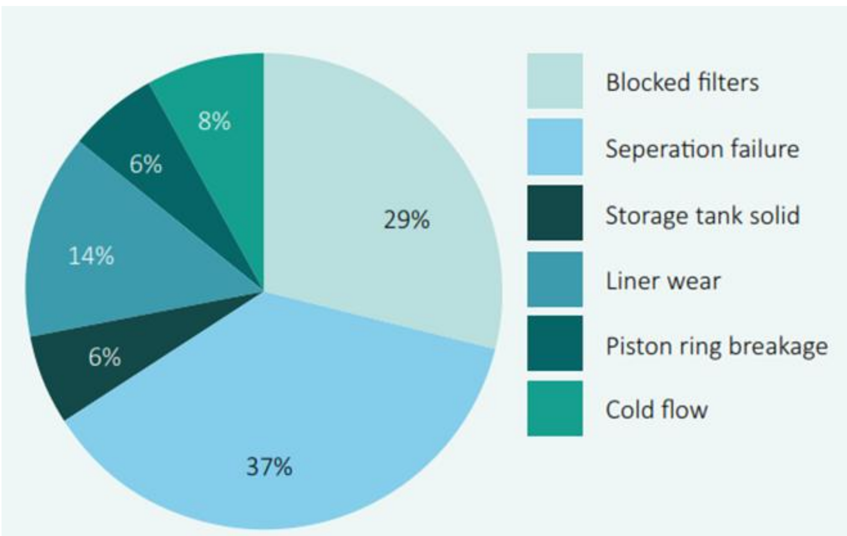

Figure 1 – The frequency of incidents experienced by vessels using VLSFO in Q1 2020

However, when considering the data obtained (2018-2020), owing to the kindness of the Lloyd's Register specialists, a special problem may be detected. In particular, if a period of three years is observed (Fig. 2), it may be noted that the separators do not operate with sufficient efficiency.

In order to provide for reliable results and conclusions, over twelve thousand samples were analysed. If we take into consideration that, according to the ISO standard 8217: 2017, the maximum allowed concentration of cat fines (Al + Si) is 60ppm, it means that the separators must have an efficiency of not less than 80%. This way, they will be able to purify the fuel from 60 ppm to 12ppm, which would be in line with the recommendations of marine engine manufacturers. However, Fig.2 shows that, for each analysed year, the majority of separators had the efficiency below 80% (from 67% of samples for 2020 to as many as 80% of samples in 2019). Moreover, an ultimately alarming fact is that 45% - 49% of all the analysed samples had a very low efficiency in the elimination of these abrasive impurities (from 0% - 60%)!

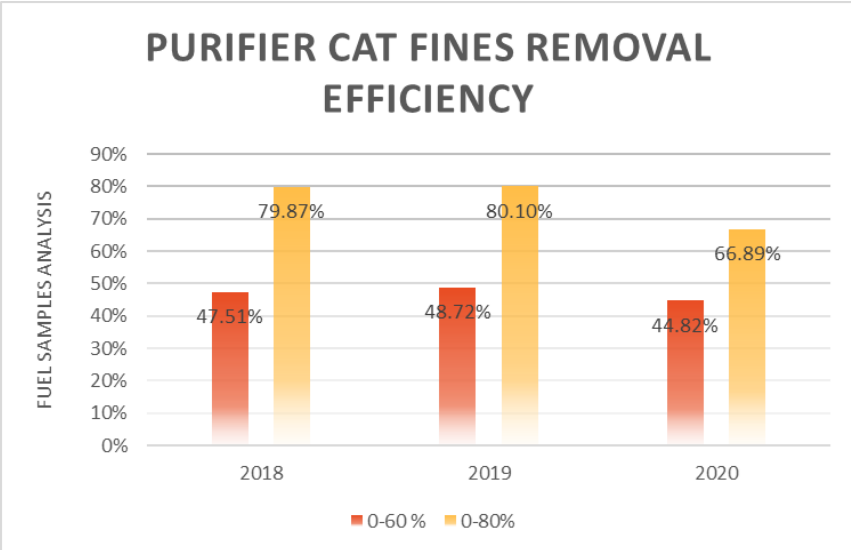

Figure 2 – Purifier efficiency in removal catalytic fines from fuel oil on ships (2018-2020)

MODEL DEVELOPMENT

The findings stated above made us think about developing a reliable model and the possibility of monitoring the quality/efficiency of the fuel oil treatment system. In the considered model, the size of the storage tank (bunker tk.) is 446 t, with the settling and service tanks having the capacity of 36 t, whereas the transfer pump capacity is 20 t/h. The daily fuel consumption of the main engine at 100% load is 45 t/d maximum continuous rating (MCR), → which can be run for an hour.

As for the developed model, normal continuous rating (NCR) will be used. The normal continuous rating for this model is at 80% MCR and the consumption under the given conditions is 36 t/d for the engine of 11,800kW. The fuel consumption on generators certainly varies due to the ship's electricity consumption, as well as the policy of the company on whether and where to use another type of fuel, that is, marine diesel oil (MDO).

This model will analyse specific cases (maximum consumption) that may be expected on a tanker ship in the following scenarios:

- When the ship is sailing at maximum speed and when she needs the minimum number of generators for normal operation (the most common case during voyage, unless the company opts for economical speed or super slow steaming (SSS)). In this case we will include the analyses of the situation when the ship is using scrubber (increased fuel consumption due to additional equipment in use);
- When the ship is in the port of discharge, that is, when the maximum fuel consumption is at the boiler and when due to the specific situation at least two diesel generators must be at work (note that this situation occurs only when cargo is being discharged, which is not so frequently). It should also be taken into account that today's

discharging operation on product tankers takes about 16 hours.

- When the ship is in navigation and when cargo requires heating, the fuel consumption on the main engine will be at the maximum, plus higher fuel consumption on the boiler and increased fuel consumption on diesel generators (this is a common situation on product tankers, depending on the fuel type).

In the model described, the problem of total fuel consumption will be specifically considered in these three extreme scenarios in which the most common case is Scenario 1. Due to the environmental considerations, increased fuel consumption will be accounted for because of the use of scrubber for exhaust gases.

Depending on the maximum fuel consumption, the load on the fuel purification system will vary. Standard fuel purification systems include filters and the most powerful element such as centrifugal fuel separator. There are many other elements that can assist in the separation of the fuel from impurities (Vukičević, Račić, & Vukašinović, 2019) but not as powerfully and effectively as the separator itself. In addition to these elements, and focusing the importance of the separator's efficiency, the company Alfa Laval proposed a way to improve the efficiency of removing catalytic impurities. According to (Alfa Laval., 2024), it is possible to increase the efficiency of purifier by 30% and additionally protect the main engine from catalytic damage by installing the latest generation Alfa Laval separator disc stack. This is an upgraded kit which may be installed by a competent Service Engineer. However, manufacturers and shipowners are generally not in favour of additional investments.

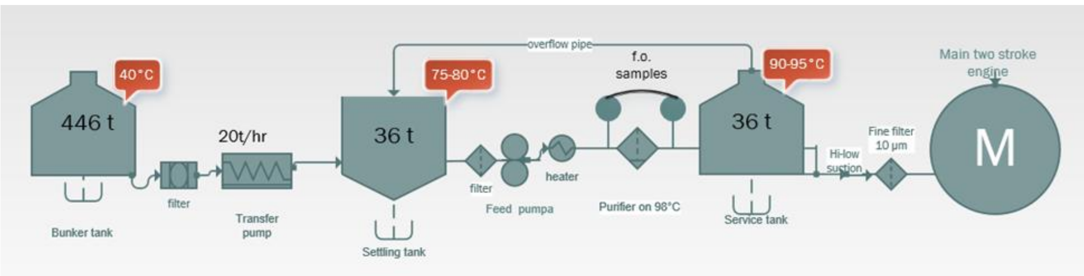

Figure 3 – Bunkering, transfer and fuel oil purification system on the model ship.

Also, by proper settling of fuel in the tanks and regular drainage, a certain amount of impurities and water may be eliminated. The maximum capacity of the analysed fuel separator in the descriptive model was 3,200 l/h. To make the model as realistic as possible, an hour a day was eliminated from calculation, which refers to the time lost during the process of sludge discharge, rinsing and restarting of the separation process. In such a case, at the maximum purifier operation, the amount of purified fuel would be:

$$3.200\ (l/h) x\ 23(h) = 73.600\ l \tag{1}$$

As may be seen, the daily fuel separation would be 73.6 m^3, while the maximum daily consumption of the main engine would be only 36 m^3. This case proves that it is unnecessary for the separator to work with 100% load, even at the maximum consumption of the main engine.

As already mentioned, the main fuel consumers on board are the main engine, generators and boilers. Therefore, it is necessary to present their consumption in the scenarios stated above (Table 1).

Table 1 – Daily fuel consumption on tanker ship

SCENARIO	DAILY CONSUMPTION ON TANKER SHIP WITH THE ENGINE OF 11.800KW				
	Main engine (M/E)	Diesel generators (D/G)	Auxiliary boiler (Aux.Blr.)	Total cons.	Load on purifier
Scen. 1 (max navigation speed)	**36 t**	3.2 t or **4.2 t with scrubber**	**0.1t** *economizer running*	**40.3 t**	**60%**
Scen. 2 (discharging cargo)	**0 t**	**5 t**	**45 t**	**50 t**	**70%**
Scen. 3 (max. speed + cargo heating)	**36 t**	**5 t**	**20 t**	**61 t**	**85%**

As may be seen in Table 1, in Scenario 1 the fuel consumption on the generators increased by 1t if a scrubber is in use, whereas the boiler operation is not required at this speed because the economizer produces sufficient quantity of steam for daily consumption. In this case, we will add only 0.1 t of its consumption for the entire day.

The model does not consider specific navigation circumstances, such as for example storm, with a great influence of wind or sea current, the influence of ballast or the "cleanliness" of the ship's keel.

In addition, engine performance is also influenced by factors such as:

- weather conditions in which the engine operates,
- resistance to air intake and back pressure of exhaust gases,
- temperature regime of engine cooling and lubrication, as well as quality of water and oil,
- gas distribution phases and gas exchange conditions,
- preload pressure,
- fuel injection pressure and fuel injection,
- evenness of fuel supply per cylinder,
- technical condition of the cylinder-piston group,
- type/quality of fuel in use.

When comparing the maximum amount of separated fuel of 73.6 t to the scenarios from Table 1, a difference may be noticed in relation to the fuel consumed. Scenarios 2 and 3 are not as common as Scenario 1 and in these cases it would be expected to increase the amount of fuel to be purified, while in Scenario 1 it may be seen that it is sufficient for the separator to operate at 60% load.

ADJUSTING THE AMOUNT OF FUEL REQURED FOR PURIFIER

In practice, it has been shown that a significant number of engineering officers do not monitor the operation of the separator, but once set, it stays that way for a long period. The problem is that they are often guided by the idea that when a larger amount of fuel is being purified, for example, at low consumption rate, it will be additionally purified during the overflow from the service tank to the settling tank. An additional problem is the lack of confidence or knowledge as they are aware of the specifics and complexity of the device. A large number of officers avoid putting another purifier in operation despite the poor performance of the fuel in use. In addition, there are hardly any fine adjustments of the purifier load. Once set, the separator is left to work that way, usually throughout the engineer(s) contract or even longer.

The complexity of the purifier device and the fact that it is usually maintained by the most junior Engineer (with the least experience) make proper handling disputable. Although the Chief Engineer has the overall responsibility for the correct operation of all the machinery, it is a rare case for them to address the complex problems of separators with additional suggestions and explanations. This would be an opportunity for junior officers to think differently and pay more attention to the operation of the purifier.

The most important parameter in setting the operation of the separator is certainly the amount of fuel that is allowed to be admitted to the separator (feed rate), as well as the fuel temperature. There are numerous cases explaining that separators with a smaller amount of fuel in their bowl are better in purifying fine impurities than when it is overfilled. It is these tiny catalytic impurities that cause problems in the engine itself. It is very important to adjust the flow and the amount the purifier needs to purify to match the total ship consumption, plus an addition of 10%. In thus it is ensured that there is always more clean fuel than that being consumed, so even if a malfunction occurs, there will be enough time to respond or start another separator.

However, the ship's crew, as said, generally leaves the same flow rate without paying attention to the fuel consumption.

PURIFIER EFFICIENCY ON THE TESTING MODEL

The efficiency of the purifier was tested on a tanker ship with a MAN B&W 6G60ME-C9 engine. The tested fuel marked RMG380 was bunkered in the port of Singapore and the analysis was performed in Viswa lab. In Table 2, a high amount of Al + Si of 57ppm may be noted.

Table 2 – Bunker fuel oil analysis results.

Bunker Port & Date:			SINGAPORE-SINGAPORE; 15-May-2021
Sample Grade:			IFO 380 - RMG 380
Bunker Quantity:			749.002 MT
Bunker Density @15°C:			988.0 kg/m^3
Bunker Viscosity @50°C:			313.6 cSt
Sulphur Content:			3.01 %
Water Content:			0.20 %
Source of the sample:			MANIFOLD
Sampling Method:			DRIP
SPECIFIED PARAMETERS FOR IFO 380 - RMG 380 & TEST RESULTS:			
Parameters	Units	Test Results	Specification Limits
Density @ 15°C	kg/m^3	985.3	(991.0 Max.)
viscosity @50°C	cSt	293.0	(380.0 Max.)
Sulphur	% (mass)	2.92	(3.50 Max.)
Water	% (vol)	0.25	(0.50 Max.)
Vanadium	ppm	176	(350 Max.)
Al + Si	ppm	57	(60 Max.)

According to some previous research from the "Cat Guar" database (MAN Diesel & Turbo, 2017) the importance of reducing the flow on the fuel separator in favour of better efficiency. The same paper points to the importance of the fuel temperature adjustments for improving the separation process. However, under the given conditions and according to the manufacturer's recommendation, it was not possible to test this.

Fig.4 explains the efficiency of the separator and its dependence on the flow through the purifier, as well as the influence of the inlet temperature of impure fuel. The purifier that works at low fuel flow, that is, at 25% flow, has as much as 90% efficiency. The results show that when the fuel temperature increases and the flow through the purifier is reduced, the fuel purifying efficiency is also increased, providing for better removal of catalytic impurities.

It should be noted here that most purifier manufacturers do not recommend purifier running at above 100°C due to water boiling.

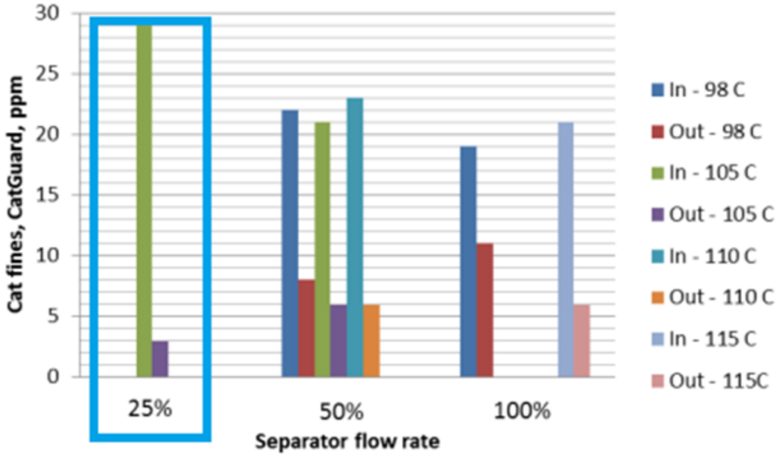

Figure 4 – Purifier efficiency in removing catalytic fines by regulating flow rate.

ADJUSTING FUEL FLOW ON PURIFIER BY USING A CALIBRATED METAL ORIFICE

Today, most modern purifiers have the ability to adjust the flow of impure fuel through them, as well as operating limits and numerous alarms that are responsible for their proper operation. There are usually two separators installed, (with the exception of for example, large container or passenger ships, where this number is usually higher). Depending on the fuel feed pump and its capacity, the amount of separated fuel will vary. On the other hand, the capacity of the feed pumps is most often associated with the capacity of the purifier, whereas it should be much higher than the daily fuel consumption on board.

In regular circumstances the operation of a single separator is considered sufficient (as it can serve the daily need for fuel). If we consider Scenario 1 from Table 1, it may be seen that in that case it suffices for the purifier to work with 60% flow. In other specific and much rarer cases, the load on the separator increases to 85%. In all the other cases (when the ship navigates at a lower speed, during manoeuvring or at anchor), this percentage drops drastically, and adjustments are necessary. Therefore, Fig. 5 shows the purifier auto-control model, developed through the Matlab program and the Simulink visual tool package.

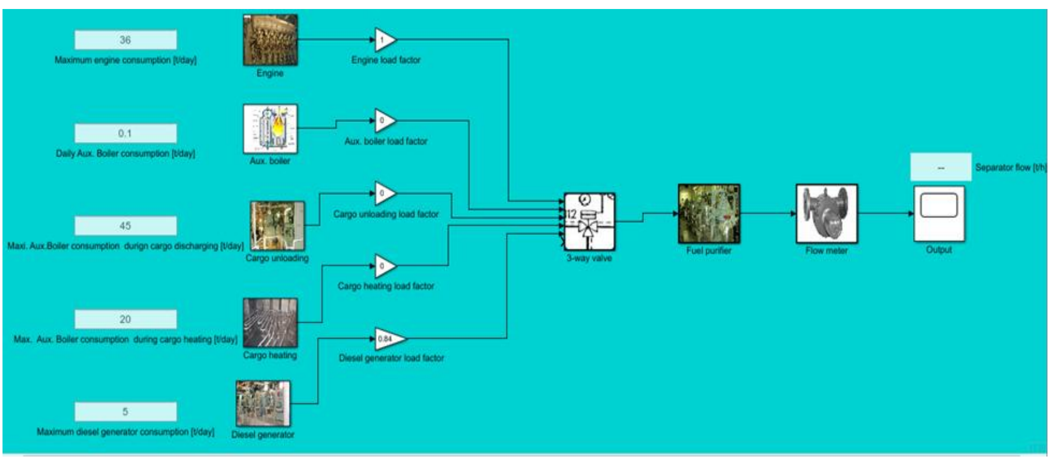

Figure 5 – Purifier efficiency in removing catalytic fines with flow rate regulation.

Fuel consumption is divided into five different categories: main engine consumption, daily regular boiler consumption, boiler consumption during cargo discharge, boiler consumption during cargo heating and diesel generator consumption. The input parameters in the simulation are the maximum daily fuel consumption for all the five categories respectively. By adjusting the load for each of the individual categories, a signal is sent showing the percentage to which the individual elements are loaded, that is, the percentage of the maximum possible fuel consumption for each of the categories. Total fuel consumption at a given moment is calculated according to:

$$\dot{Q}_{tot} = \sum_{i=1}^{5} \dot{Q}_{max,i} \cdot \eta_i \tag{2}$$

where:

$\dot{Q}_{tot}$ [t/day] is the total fuel consumption at a given moment,

$\dot{Q}_{max,i}$ [t/day] is the maximum fuel consumption for each of the categories,

η_i [%] is the percentage of maximum possible fuel consumption for each of the categories.

Based on the current fuel consumption, a signal reaches the three-way valve and regulates the opening of the valve towards the fuel separator to the required percentage. The required percentage of valve openness is the function of the received signal and is determined through polynomial interpolation made based on the specific flow values applicable to the valve in use, maximum flow, minimum flow, flow at some specific points, etc., according to the following equation:

$$P = f\left(\dot{Q}_{tot}\right) = p_1 \dot{Q}_{tot} + p_2 \tag{3}$$

where:

P [%] is the percentage of valve opening towards the fuel separator,

p1, p2 are the polynomial coefficients calculated based on specific flow values for the valve being used.

After passing through the valve, the fuel passes through the fuel separator and flow meter where its flow rate is read.

On modern types of separators, the process of separation and discharge of accumulated sediment and water is performed automatically. It is necessary to periodically check the operation of the purifier, along with control and alarm notification systems. Some of the alarms that may be sounded during this process are low/high fuel pressure alarm, high/low fuel temperature alarm, high vibration alarm, freshwater shortage (displacement and flushing water), water drain error alarm, etc.

It is known that in case the purifier is not able to release sludge and water, the control unit repeats the procedure, the fuel is returned to the tank or recirculated to the system via a 3-way valve (Fig. 5).

The flow of impure fuel through the separator is often regulated by controlling the "back pressure" valve, which regulates the back pressure, as may be seen on Fig. 6. The process of heavy fuel oil separation on two different types of tanker ships was simulated on engine room simulators. This simulator is equipped with main engines marked MAN B&W 6S50MC-C and MAN B&W 6S60MC-C (which correspond in size and type to the ship's system and the ship in operation with which the comparison was made). The simulation was done by adjusting the valve to the maximum value allowed on the simulator.

Figure 6 – Flow regulation on purifier no.1 via Auto Control Panel

It was possible to adjust the flow attenuation to up to 50%, that is, up to 35.4% of the purifier capacity. Lower values could not be simulated, and separation efficiency data are given in the table below.

From Table 3, it may be seen that on the 60MC model it was not possible to reduce the flow to below 50%. Due to the impossibility to further reduce the amount of flow, any further elimination of fine impurities was not possible either. In real-life situations, however, it is possible to achieve this by using metal calibrated orifices (shown in Fig.7). In this case, it should be noted that when reducing the flow on the separator, certain amount of pressure was created on the heaters because the fuel could not pass through the valve with a spring (Fig. 7).

Table 3 – Fuel oil purifier efficiency on engine simulators.

	SIMULATOR MODEL	
	MAN B&W 6S50 MC	MAN B&W 6S60 MC
Purifier load	Flow (l/h) – purifier efficiency (%)	
100%	2460 l/h - 61%	2961 l/h - 61.5%
75%	1875 l/h - 71%	2291 l/h - 68.3%
50%	1255 l/h - 79%	1523 l/h - 75.5%
35.4%	883 l/h - 85%	n/a

Figure 7 – Valve with a spring and calibrated orifice for regulating the fuel flow.

By inserting a calibrated orifice, it was possible to influence the spring, so the fuel could normally pass back into the fuel tank. This way, it was possible to achieve the desired flow rate. The capacity of the feed pump was, as in the simulation, 3,200 l/h, and in the way described above, the flow was reduced to as much as 800 l/h, that is to 25% of the flow (Fig. 8).

To confirm the justification for these procedures, a sample of purified fuel was analysed at the Viswa lab laboratory. The efficiency of fuel separation when it comes to catalytic impurities (Al + Si) at the minimum flow was as high as 81% and above average (Fig. 9). In addition to the efficient elimination of impurities, a reduction in the finest impurities, specifically those of 4.6 and 14 microns, is also notable.

Figure 8 – Display of adjustable, maximally reduced flow through the fuel separator using calibrated orifice

ANALYSIS OF WATER, SEDIMENT AND METALS

	REFERENCE PARAMETERS			PURIFIER PERFORMANCE PARAMETERS						
LOCATION	Den	Vis	Sul	H2O	TSE	Al+Si	NA	FE	CA	PEFN
DRIP SAMPLE	985.3	293.00	2.92	0.25	0.03	57	21	16	8	35*
BEFORE PURIFIER # 1	985.2	319.50	2.94	0.15	0.02	43	19	13	8	41
AFTER PURIFIER # 1	985.3	330.70	2.92	0.15	0.01	8	12	7	4	54
IMPROVEMENT IN PURIFIER %				0	50	81	37	46	50	
OVERALL PURIFIER EFFICIENCY				Above Average						

PARTICLE COUNT ANALYSIS

LOCATION	> 4µ	6µ	14µ
BEFORE PURIFIER # 1	19	17	15
AFTER PURIFIER # 1	17	15	13

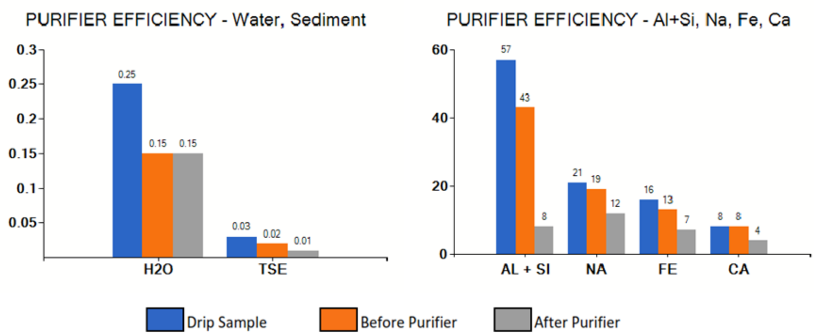

Figure 9 – Efficient elimination of catalytic impurities by reducing fuel flow

CONCLUSION

Catalytic impurities in the fuel can create huge problems and high costs on board in a very short period of time. Their impact will greatly contribute to the wear of vital parts on the main engine. In order to reduce this impact, it is necessary to influence the ship's fuel purification system. In addition, a regular analysis of the purifier efficiency should be done in order to provide a timely response for avoiding severe and dangerous wear. The shipowners aim for the most cost-efficient way to provide them with a safe system and reliable engine operation. In this paper, we wanted to show that there is still a large number of separators that operate at an unsatisfactory level of efficiency, which is one of the prerequisites for good quality fuel separation. It is known that reducing the flow on the separator increases its separation efficiency in regard to abrasive impurities. Nevertheless, in reality this flow is not adequately regulated, or it cannot be reduced below a certain flow rate. The paper also shows that the use of calibrated orifices can lead to an additional reduction in fuel flow to as much as 25% (when there is no high fuel consumption). This would result in a significantly enhanced separation of catalytic impurities from the fuel. Considering that the paper takes into account the extreme cases of fuel consumption on a tanker ship, in all other cases the load on the separators is expected to be significantly lower.

At lower loads, that is, with low fuel consumption, the purifier efficiency may be influenced by adding an orifice, while in other cases it is necessary to do fine flow regulation. This is feasible by automatic regulation of the flow through the purifier and optimization of the system itself.

DECLARATIONS OF INTEREST STATEMENT

The authors affirm that there are no conflicts of interest to declare in relation to the research presented in this paper.

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ULOGA FEMINIZMA I JAČANJE ZAKONODAVNOG OKVIRA PROTIV NASILJA NAD ŽENAMA U BOSNI I HERCEGOVINI

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APSTRAKT

Nasilje nad ženama identifikuje se kao stalna odlika bosanskohercegovačkog društva, sa sve izraženijom tendencijom da i femicid postane njegova konstanta. U prvom dijelu rada analizira se značaj feminizma kao segmenta ideološkog političkog diskursa koji utiče na zakonodavnu aktivnost političke vlasti, ali i na društvo na opštem nivou u odnosu i borbi protiv nasilja nad ženama. Ukazano je na specifičnosti feminizma, na istoriju i razvijenost ženskog pokreta u Bosni i Hercegovini, sa fokusom na nedovoljnu prihvaćenost, uvaženost i uključenost feminizma u politički život našeg društva.

Porodica kao osnovna ćelija društva, danas je ozbiljno ugrožena, s obzirom da je povećan broj nasilja u porodici gdje je žrtva najčešće žena. Stoga, u kontekstu nasilja u porodici, drugi dio rada se bavi problematikom nasilja nad ženama, prvenstveno femicida, sa zakonskog aspekta. Cilj je ukazati na značaj inkriminacije femicida i adekvatne zakonske zaštite žena, a sve u cilju prevencije femicida, procesuiranja i kažnjavanja izvršioca.

Ključne riječi: femicid, feminizam, Bosna i Hercegovina.

UVOD

U Bosni i Hercegovini 2024. godina nazvana je „godinom femicida“ jer je, prema nezvaničnim podacima, tokom ove godine ubijeno 14 žena (RTV BN, 2024). U periodu od 2015. do kraja 2023. godine, prema medijskom izvještavanju, ubijeno je više od 60 žena (Bakija, 2023), od čega tokom 2021–2022. godine prema podacima Visokog sudskog i tužilačkog savjeta BiH 19 žena (Kešmer i Terović, 2024). Krivično djelo nasilje u porodici inkriminisano je u svim krivičnim zakonima/zakonicima u Bosni i Hercegovini. Ustavi na svim nivoima vlasti garantuju zabranu diskriminacije na osnovu pola kao prevenciju nasilja nad ženama, koje se svrstava u nasilje u porodici. Međutim, naše zakonodavstvo još uvijek nije inkriminisalo femicid. Zakonska i opšta društvena borba protiv nasilja nad ženama zavisi i od ideološke matrice društva, u kojoj se pravima i položajem žena, prvenstveno, bavi feminizam.

SPECIFIČNOSTI I CENTRALNE TEME FEMINIZMA

Prema istraživanju „Rasprostranjenost i karakteristike nasilja nad ženama u Bosni i Hercegovini" koje je sprovela Agencija za ravnopravnost polova BiH, nasilje nad ženama, kao dio nasilja u porodici, jedan je od najvećih izazova bosanskohercegovačkog društva, problem koji je relativno skoro izašao iz privatne u javnu sferu. Ono se veoma dugo posmatralo isključivo kao privatna porodična stvar. Istraživanja su pokazala da nasilje nad ženama u BiH ne predstavlja izolovane, sporadične ili ekscesne oblike konflikta, već proističe iz sistematskih rodnih nejednakosti koje se simultano uspostavljaju u sferi javnog i privatnog života (Agencija za ravnopravnost polova BiH [ARPBiH], 2013). Najekstremniji oblik nasilja nad ženama je femicid koji se definiše kao „sistematsko ubijanje žena jer su žene. To je zločin u kojem je jedini motiv za ubistvo pol žene" (JASS, 2013, str. 12). Ovo su pitanja koja po svojoj prirodi pripadaju i feminizmu, čiji je osnovni zadatak borba samih žena za unapređenje svojih prava, dakle i prava na zaštitu, slobodu i život uopšte.

Zakonsko regulisanje rješavanja nasilja nad ženama je u nadležnosti političke vlasti čiji karakter zavisi i od njenih ideoloških postulata i stremljenja. Osim toga, na opšti odnos društva prema problemu nasilja nad ženama utiču i dominantne ideološke vrijednosti u političkom diskursu odnosno kako one vide položaj žene. U Bosni i Hercegovini kao postkonfliktnom, podijeljenom društvu uređenom prema modelu konsocijacijske demokratije (Simović i Ilić, 2022) u odnosu prema ženama, njihovom statusu i pravima prisutni su ideološki uticaji (neo)liberalizma, nacionalizma, socijalizma, te sve intenzivnijeg religijskog fundamentalizma. Najmanje su prihvatljivi uticaji feminizma kao samostalnog društvenog agensa, što je posljedica i dalje veoma izraženog patrijarhalnog, tradicionalnog karaktera našeg društva. Istorija i današnji položaj žena nam ukazuju da bez fokusa na konkretnu akciju, prvenstveno na uticaj u političkom životu društva teško je ostvariva bilo kakva ideja o poboljšanju položaja žena, posebno na Balkanu.

Razvoj ideje o unapređenju prava i položaja žena vezuje se za period Francuske buržoaske revolucije, dok se kao organizovani ženski pokret feminizam razvija u 19. vijeku, a tek je „u 20. vijek ušao kao ženski pokret naoružan feminističkom ideologijom, pri čemu je osnovna uloga ideologije bila da obrazloži žensko pravo na emancipaciju" (Coole, 2006, str. 219).

Potpuno ironično, feminizam se javlja u doba kada se sve mijenja – sve osim položaja žena. Iako su žene 1789. godine prve krenule ka Versaju, započevši tako revoluciju, one nisu dobile status građanina, a samim tim ni čovjeka, kako ga je definisala Deklaracija o pravima čovjeka i građanina. Zato je Olimpija de Guž pisala paralelnu Deklaraciju o pravima žene i građanke jer žene zbog svog pola ostaju lišene slobode i mogućnosti da se rađaju i žive jednake u pravima. Tako se u doba Francuske revolucije prvi put pojavljuje konzistentna ideja o neophodnosti da žene istupe iz prostora privatnosti (dom i porodica), iako će se zahtjevi o njihovom učešću u javnoj sferi razlikovati (Zaharijević, 2008).

Početak feminističkog pokreta vezuje se za djelo „Odbrana prava žena" iz 1792. godine Meri Vulstonkraft, koja se smatra „začetnicom feminizma" (zastupa tezu da žene treba da imaju ista prava i privilegije kao i muškarci, na osnovu toga što su i one „ljudska bića"). Prvi talas feminizma shodno tome da je posljedica prosvjetiteljstva bio je pod uticajem liberalizma, a osnovni cilj bio je borba za pravo glasa. Te svoje liberalne korijene feministička teorija rijetko kada i osporava, tokom 18. i 19. vijeka feministkinje su nastojale primijeniti liberalističke principe o slobodi, jednakosti, autonomiji i individualnim pravima na žene (Lončarević, 2022).

Drugi talasa feminizma pokrenula je Beti Fridan sa djelom „Mistika ženskog roda", 1963. godine, u kome kritikuje kulturni mit da žena traži sigurnost i ispunjenje u porodičnom životu, a sve to zapravo služi odvraćanju žena od ulaska u sferu zaposlenja, uopšte javnog života. Cilj drugog talasa nije bio samo politička emancipacija, već „žensko oslobađanje", cilj koji je zahtijevao revolucionaran proces društvene promjene.

Ova druga faza je najznačajnija, naziva se radikalni feminizam, tada se „feminizam razvio u osobenu i etabliranu ideologiju čije ideje i vrijednosti osporavaju većinu konvencionalne političke misli“ (Hejvud, 2005, str. 255). Sada se ne ukazuje samo na nepovoljan zakonski ili društveni položaj žena, već na činjenicu da patrijarhalne vrijednosti i vjerovanja prožimaju kulturu, filozofiju, moral i religiju društva. Radikalni feminizam je razvio sistematsku teoriju polnog ugnjetavanja, njegova glavna karakteristika je vjerovanje da je polno ugnjetavanje osnovna odlika društva i da su svi drugi oblici nepravde kao npr. klasna eksploatacija ili rasna mržnja sekundarnog značaja. Uvodi se kategorija „roda“, to je društveni rascjep koja je najdublji i politički najznačajniji, važniji i razorniji od društvene klase, rase ili nacije (Hejvud, 2005). Kroz ciljeve u drugom talasu žene su uspjele probleme vezane za odnose u braku i porodici, kao što su razvod i nasillje, pretvoriti u javni problem (Mihaljević, 2016).

Osnova feminizma je odbacivanje patrijarhata, prvenstveno načela „fetišizma izbora“ i „zatvora biologije“ koje patrijarhalna matrica u zapadnim liberalnim društvima prihvata i insistira na tome da je rodna nejednakost neizbježna, ali neproblematična. A feminizam smatra da žene nisu ni „zatvorene biologijom“ niti su „oslobođene individualnim izborom“, te polazi od tri teze: ukorjenjenost roda, postojanje patrijarhata i potreba za promjenom (koja može i mora biti ostvarena društvenom akcijom) (Chambers, 2013, pp 562-582). Tako je feminizam ujedno i pokret, ideologija, lično uvjerenje, mreža teorijskih pozicija, „pojmovni okvir, skup različitih aktivnosti čiji je cilj pospešenje položaja u kojem se žene danas nalaze, a neretko i pokušaj da se istorija pročita drugačije, da se iz njenog tkanja „izvuku“ neka nevidljiva mesta koja bi mogla da posluže kao putokaz za buduće prakse“ (Zaharijević, 2008, str. 384).

Centralne teme feminizma su, osim patrijarhata, podjela na javno i privatno, pol i rod, jednakost i različitost (Hejvud, 2005, str. 256). U tradicionalnom shvatanju politička aktivnost pripada sferi javnog, a ne privatnog gdje pripadaju porodica i lični odnosi. Javna sfera (osim politike tu spada i posao, rad uopšte) se vezuje za muškarca, a privatna sfera pripada ženi. Ako se politika događa samo unutar javne sfere, uloga žene i polne jednakosti od minimalnog su političkog značaja, žene su primarno ograničene na ulogu majke, domaćice i tako isključene iz javne sfere. Radikalni feminizam ukida podjelu na javno i privatno, ustaje protiv ideje po kojoj politika ostaje ispred vrata doma i proklamuje „lično (privatno) je javno (političko)“, politika je aktivnost koja se odigrava unutar svih društvenih grupa.

Kako bi se istakla centralna uloga polnog ugnjetavanja, radikalni feminizam insistira na tome da se društvo shvati i opiše kao „patrijarhalno“. Patrijarhat se odnosi na sistematski, institucionalizovani i sveobuhvatni proces rodnog ugnjetavanja. Ideju po kojoj je biologija sudbina, feministkinje tradicionalno osporavaju povlačenjem oštre razlike između pola i roda. Pol se odnosi na biološke razlike između muškaraca i žena (te razlike su prirodne i nepromjenjive). Rod je kulturološki fenomen, odnosi se na različite uloge koje društvo pripisuje muškarcima i ženama. Feminizam poriče nužnu ili logičnu vezu između pola i roda i smatra da se rodne razlike izgrađuju kroz društvo, pa i kroz politiku. Žene i muškarce ne treba prosuđivati na osnovu njihovog pola, već kao pojedince, osobe, samostalna živa bića. Tradicionalno, žene su zahtijevale jednakost sa muškarcima, te se feminizam označava i kao pokret za postizanje jednakosti polova. Međutim, pitanje jednakosti otkriva nam i glavna razmimoilaženja unutar feminizma. Liberalni feminizam se bori za zakonsku i političku jednakost sa muškarcima, jednak pristup javnom carstvu; socijalistički feminizam ističe da jednaka prava mogu biti bez značaja sve dok žene ne budu uživale i društvenu jednakost (traži se ekonomska moć, što znači postavljanje pitanja kao što su vlasništvo nad bogatstvom, nejednake plate za jednak rad i dr.); radikalni feminizam proklamuje jednakost u porodičnom i ličnom životu (Hejvud, 2005).

Značaj savremenog feminizma je u tome što je skrenuo pažnju na potrebu da se okonča muško nasilje nad ženama, pri čemu je polazni stav da je ta vrsta nasilja različita u odnosu na druge oblike nasilja prisutne u našem društvu, jer je specifično povezana sa politikom seksizma i muške supremacije: pravom muškaraca da budu nadređeni. Za kontinuiranu feminističku borbu zaustavljanja nasilja nad ženama od neprikosnovenog značaja je da ona bude viđena kao dio opšteg pokreta za okončanje nasilja (Huks, 2006, str. 84).

FEMINIZAM U BOSNI I HERCEGOVINI I NASILJE NAD ŽENAMA

Prva ženska udruženja na teritoriji današnje BiH osnovana su u vrijeme austrougarske vlasti i bila su nacionalno-vjerskog predznaka. Dobrotvorna zadruga pravoslavnih Srpkinja bilo je prvo žensko udruženje u BiH koje je osnovano 1901. godine, a u Sarajevu je 1913. godine bilo registrovano pet ženskih udruženja koja su se bavila humanitarnim radom i brojala su 1330 članica (Popov-Momčinović, 2023; Popov-Momčinović, 2024). U toku Drugog svjetskog rata najznačajniji oblik organizovanja žena bio je Antifašistički front žena (AFŽ) formiran u Bosanskom Petrovcu 1942. godine koji je predstavljao prvu masovnu žensku organizaciju na ovim prostorima (Mihaljević, Planinić i Ljubičić, 2023).

Pravo glasa žene na području bivše Jugoslavije dobile su 1945. godine na osnovu zakona o biračkim spiskovima kada su stekle pravo učešća na izborima te godine, a prvim poslijeratnim ustavom FNRJ 1946. godine izjednačene su sa muškarcima u svim oblastima privrednog i društveno-političkog života. U periodu socijalizma žene su imale imale poseban status kao specifična kategorija radnog naroda Jugoslavije, njihova emancipacija i uključenost u sistem je ostala pri vrhu političke agende. Rodni diskurs u SFRJ uglavnom se fokusirao na ulogu žene u procesu industrijalizacije, s tim što je pokušano usklađivanje i integracija radnih sa funkcijama koje žene obavljaju u privatnoj sferi, sa akcentom na materinstvo. Žensko pitanje je definisano kao dio klasnog pitanja, na djelu je bila polovična emancipacija žena (Popov-Momčinović, 2023).

Građanski rat bio je tačka sloma i preokreta za feminizam u BiH, potpuno je marginalizovao položaj žene i učinio je žrtvom, a to će istovremeno biti i inicijalna kapisla koja će podstaći ponovnu afirmaciju borbe za prava i zaštitu žena. Prema Popov-Momčinović, usponom etnonacionalizma koji je rastao uporedo sa mizoginijom jer je baziran na izrazito herojskoj i maskulinoj mitologiji, žene gube politički značaj i postaju puko sredstvo u kandžama etnopolitike, raste nasilje nad ženama. Tako se masovno silovanje žena, odnosno rodno zasnovano nasilje, koristilo kao jedno od sredstava etničkog čišćenja, tačnije kao ratna strategija u toku građanskog rata u BiH (Popov-Momčinović, 2023, str. 100), u kome je prema procjenama silovano oko 20.000 žena. Zahvaljujući medijima koji su senzibilizirali javnost o zločinima u BiH, prvi put u novijoj istoriji kršenje ženskih prava postalo je vidljivo na međunarodnom nivou (Mihaljević, et al. 2023). Građanski rat postavio je osnovu za opstanak i eskalaciju femicida u postdejtonskoj BiH.

Paradoksalno ili ne, podsjeća Popov-Momčinović, viktimizacija i kult žrtvovanja obilježiće uspon ženskog pokreta u BiH. Upravo u ratu nastaju mnoge formalne i neformalne ženske grupe i udruženja koja se okupljaju s ciljem pružanja pomoći zlostavljenim ženama i uopšte ugroženom stanovništvu, ne baveći se etničkim razlikama. Ovakav oblik angažmana žena smatrao se društveno prihvatljivim jer je odgovarao normama patrijarhalnog društva. Sa druge strane strane, pitanje ratnog nasilja nad ženama je otvorilo prostor za politizaciju pitanja nasilja nad ženama u BiH, čime je stvoren okvir za primjenu postulata radikalnog feminizma poput „lično je političko" (Popov-Momčinović, 2023, str. 112-113).

Rad i djelovanje ženskih pokreta u postdejtonskom periodu intenzivirali su se velikim dijelom zahvaljujući uticaju međunarodnih nevladinih organizacija, pri čemu je fokus bio na pomoć ženama žrtvama nasilja u ratu. Tako je rodno zasnovano nasilje kontinuirano u fokusu djelovanja ženskog pokreta još od ratnog perioda, a u poslijeratnom periodu aktivnosti su proširene i na problematiku nasilja nad ženama u porodici čime je utaban put za primjenu feminističkih principa u pristupu rodno zasnovanom nasilju. Danas se uloga ženskih organizacija u BiH smatra ključnom u procesima lobiranja, usvajanja, harmonizacije zakona u vezi sa nasiljem nad ženama, te monitoringa njihove primjene i uopšte pomoći državnim institucijama u tom procesu (Popov-Momčinović, 2024).

U analizi položaja i prava žena u Bosni i Hercegovini, ocjene su da su političke institucije u okviru konsocijacijskog modela demokratije nepovoljne za efektivno predstavljanje žena zato što im je fokus na etničkom predstavljanju koje oblikuje političko učešće. Kod nas su i ratne strukture faktički ostale netaknute u postratnom periodu, te su se zato žene u BiH više okretale civilnom društvu, posmatrajući to kao sferu u kojoj imaju više slobode za artikulaciju vlastitih interesa i zahtjeva (Popov-Momčinović, 2024). Dejtonski mirovni sporazum je „rodno slijep“, što od početka postdejtonske BiH ima negativan uticaj ne samo na položaj žene, već i na sposobnost društva da se politički i demokratski razvija (Kapić, 2023). Danas je feministički pokret najjači segment civilnog društva Bosne i Hercegovine, tu je stvorena neka vrsta alternativnog javnog foruma u kome su teme poput patrijarhata i nasilja nad ženama od nevidljivih postale vidljive (Popov-Momčinović, 2023).

Iako je položaj žene u Bosni i Hercegovini prividno zadovoljavajući jer su sa zakonskog aspekta ravnopravne s muškarcima, realnost nam pokazuje i dalje visok nivo diskriminacije žena, društveno-politička sfera „na različite načine isključuje žene, posebno usljed uticaja svuda prodirućeg trenda retradicionalizacije i repatrijarhalizacije, što je jedno od ratnih nasljeđa i posljedica urušavanja socijalizma (Popov-Momčinović, 2024, str. 321). Uloga i prava žene kod nas su i dalje primarno određeni patrijarhalnim modelom funkcionisanja društva, pri čemu na poimanje rodnih koncepata kod sva tri konstitutivna naroda najviše uticaja ima religijsko-interpretativno nasljeđe (Mihaljević, et al., 2023).

ZAKONSKA REGULATIVA NASILJA NAD ŽENAMA U BIH SA OSVRTOM NA FEMICID

U pogledu međunarodnog pravnog okvira kojim se štite prava žena, Bosna i Hercegovina je članica Ujedinjenih nacija i Savjeta Evrope, te samim tim i potpisnica međunarodnih dokumenata za zaštitu ljudskih prava usvojenih na nivou ovih organizacija. Sa druge strane, kao zemlja u procesu stabilizacije i pridruživanja Evropskoj uniji u obavezi je da prati i usklađuje svoje zakonodavstvo sa evropskim. Ujedinjene nacije usvojile su niz dokumenata kojima je ženama priznato pravo na uživanje prava u oblastima u kojima su bile ugrožene, naročito u javnom i političkom životu, ali i u oblasti privatnog života. Ti dokumenti su: Konvencija o političkim pravima žena (1953), Konvencija o nacionalnosti udatih žena (1957), Konvencija o pristanku na brak, minimalnoj dobi za sklapanje i registriranje braka (1962).

Pravni osnov za primjenu gotovo svih međunarodnih ugovora jeste Ustav Bosne i Hercegovine. Aneksom I Ustava BiH pod nazivom „Dodatni sporazumi o ljudskim pravima koji će se primjenjivati u Bosni i Hercegovini“ popisane su konvencije, povelje i paktovi koji će se poštovati u državi, između ostalih, i Konvencija o ukidanju svih oblika diskriminacije žena (1979) i Konvencija o državljanstvu udatih žena (1957). Obaveza Bosne i Hercegovine, kao strane potpisnice ovih i drugih konvencija, podrazumijeva usklađivanje zakonodavstva i njegove primjene sa standardima koji proizlaze iz međunarodnih dokumenata za zaštitu prava žena. Poseban značaj imaju Centar za jednakost i ravnopravnost polova – sa ciljem da pruži podršku uvođenju jednakosti i ravnopravnosti polova u sve oblasti života i rada u Republici Srpskoj kroz zakone, politike i programe i Gender centar Federacije Bosne i Hercegovine, radi vršenja stručnih i drugih poslova vezanih za provođenje načela jednakosti i ravnopravnosti polova i implementaciju odgovarajućih međunarodnih konvencija i ugovora.

Nasilje nad ženama kao dio nasilja u porodici, kriminalizovano je kao krivično djelo nasilja u porodici se može počiniti primjenom nasilja, prijetnjom da će se napasti na život i tijelo žrtve, ali i ugrožavanjem spokojstva, tjelesnog integriteta ili duševnog zdravlja člana porodice drskim ili bezobzirnim ponašanjem (Malešić, Stojanović i Nalić, 2022). Prema motivu i korištenju sredstava, nasiljem se može smatrati: „fizičko nasilje koje može biti šamaranje, šutiranje, paljenje; ekonomsko nasilje koje je prisvajanje cjelokupne imovine, oduzimanje prihoda; seksualno nasilje, a to su nepoželjni seksualni komentari, bolni i ponižavajući seksualni čin, incest; psihičko nasilje je zlostavljanje, zastrašivanje, vršenje pritiska da žena abortira ili rodi dijete" (Ivančević, 2021, str. 10).

Teško je utvrditi obim prisutnosti nasilja nad ženama i nasilja u porodici u Bosni i Hercegovini. Razlozi za ovakvo stanje su skrivena priroda problema, neprijavljivanje slučajeva nasilja u porodici, nepostojanje jedinstvene statističke evidencije i tretiranje nasilja u porodici kao „privatnog problema". Prema istraživanjima, više od polovine žena iz uzorka (47,2% u BiH, 47,2% u FBiH i 47,3% u RS-u) doživjelo je bar neki oblik nasilja nakon što je navršilo 15 godina života. Nalazi ukazuju na to da je psihičko nasilje najrasprostranjenije, sa ukupnom stopom prevalencije od 41,9% tokom života i 10,8% u toku posljednjih godinu dana, te da iza njega slijedi fizičko nasilje, sa stopom prevalencije na životnom nivou od 24,3%, a tokom posljednjih godinu dana 2,4%. Seksualno nasilje doživjelo je tokom odraslog života 6% žena, dok je ovakvo iskustvo u toku posljednjih godinu dana imalo 1,3% žena (ARPBiH, 2013).

Žene predstavljaju većinu žrtava nasilja u porodici i ostalih oblika rodno zasnovanog oblika nasilja, a učinioci tog nasilja su uglavnom muškarci. U okviru nasilja, kao najekstremnija manifestacija nasilja u porodici, izdvaja se femicid – rodno zasnovano nasilje ili nasilje prema ženama na osnovu njihovog rodnog identiteta. U kontekstu Bosne i Hercegovine, pojam femicid je u javni prostor ušao nakon što je kroz medijska izvještavanja postalo jasno da su ubistva žena, najčešće u okviru intimnih partnerskih odnosa, u porastu.

Pojam femicid datira iz 1801. godine kada je prvi put upotrebljen u britanskoj publikaciji „The Satirical Review of London at the Commemcement of the Nineteenth Century" da označi ubijanje žena, eng. the killing of a women (Batrićević, 2016). Femicid je ubistvo učinjeno prema osobama ženskog pola, motivisano polom žrtve, mizoginijom, osjećajem superiornosti i nadmoći nad ženama, u čijoj osnovi su štetni rodni stereotipi o ulogama žena i muškaraca, a povezan je i sa drugim oblicima nasilja prema ženama. Femicid najčešće nije incident već je posljedica dugotrajne izloženosti raznim oblicima nasilja od strane počinioca. Uzroci nasilja nad ženama povezani su s opštim položajem žena u društvu, diskriminacijom žena, rodnim ulogama, nejednakom raspodjelom moći između muškaraca i žena, rodnim stereotipima, predrasudama i nasiljem nad ženama.

Nema jedinstvene definicije femicida. Kratka i jasna definicija jeste „ubijanje žena od strane muškarca zato što je žena" (Đukanović, 2020, str. 3). Femicid obuhvata „sva ubistva osoba ženskog pola, bilo kog uzrasta, koja se mogu okarakterisati kao mizogina i seksistička" (Caputi, & Russel, 1992, str.15). Upravo nedostatak razumijevanja šta predstavlja femicid je prepreka da se on prenese u krivičnopravni okvir. Naime, u pravnom smislu da bi se slučaj smatrao femicidom mora da postoji namjera da se izvrši ubistvo i dokazana povezanost između krivičnog djela i ženskog roda žrtve (Domazetovska, Platzer, & Plaku, 2014).

Jedna od osnovnih podjela femicida izvršena je prema odnosu ubica i njihovih žrtava: femicid intimnog partnera (izvršioci muževi/bivši muževi, ljubavnici/seksualni partneri, bivši ljubavnici/seksualni partneri, momci/bivši momci), porodični femicid (izvršioci otac/očuh, braća, polubraća, ujak, djed, svekar, djever), femicid koji su izvršili drugi poznati izvršioci (prijatelj porodice, muška figura autoriteta, na primer nastavnici, sveštenici, kolege na poslu), femicid koji su izvršile nepoznate osobe muškog pola prilikom izvršenja nekog drugog krivičnog djela, razbojništva, razbojničke krađe sa smrtnim ishodom, u oružanim sukobima (Russell, 2008).

Gotovo polovina žena u BiH (48 posto) iskusila je neki oblik nasilja, uključujući i nasilje od strane intimnog partnera, nepartnera, uhođenje ili seksualno uznemiravanje, od svoje petnaeste godine. Preciznije rečeno, skoro četiri od deset žena (38 posto) izjavile su da su iskusile psihičko, fizičko ili seksualno nasilje od petnaeste godine od partnera ili nepartnera (FBiH: 36 posto, RS: 39 posto). Istraživanja pokazuju da je u pogledu profila izvršioca, u pogledu njihove osuđivanosti, većina nije bila ranije osuđivana (60%), dok je njih 40% ranije izvršilo krivično djelo (Beker, 2023). Prema istraživanjima sprovedenim u Bosni i Hercegovini, 90% građana izražava visok stepen svjesnosti o problemu nasilja u porodici, ali da 45% posto građana, na nasilje u porodici još uvijek gleda kao privatni problem (Gender centar FBiH, 2023). Ovo pokazuje da naše društvo u procesu tranzicije postaje svjesno određenih problema, ali patrijarhalni društveni kontekst još uvijek ima značajan uticaj te se rješavanje datih problema smatra privatnom stvari. U zakonodavstvu Bosne i Hercegovine, u toku su pokušaji uvođenja femicida u cilju zaštite žena. Amandmani kojima se traže izmjene Krivičnog zakona FBiH, se odnose na uvođenje krivičnog djela „Teško ubistvo žene“, koje definiše kažnjavanje izvršioca rodno zasnovanog ubistva ženske osobe, kaznom najmanje deset godina ili kaznom dugotrajnog zatvora.

Nacrtom Krivičnog zakonika kojim je definisan femicid, koji je odbijen u Republici Srpskoj, definiše se lišenje života ženskog lica, a članovi su porodice ili bliske osobe, bivši ili sadašnji partner bez obzira da li su živjeli u zajedničkom domaćinstvu, a dodaje se i element prethodnih zlostavljanja ili odbijanje partnerstva. Zakon o zaštiti od nasilja u porodici definiše nasilje u porodici, nešto opširnije nego Krivični zakonik, navodeći da je nasilje „akt fizičkog, seksualnog, psihičkog ili ekonomskog nasilja kao i prijetnje koje izazivaju strah od fizičke, seksualne, psihičke i ekonomske štete kod drugog člana porodice ili i porodične zajednice, učinioca prema članu porodice ili porodične zajednice“ (Zakon o zaštiti od nasilja u porodici, 2019).

Ovim zakonom definisane su sigurne kuće kao posebna mjera podrške kojim se obezbjeđuje siguran smještaj i pomoć žrtvama nasilja u porodici. U BiH trenutno imamo osam sigurnih kuća (u RS tri, u FBiH pet). Jedan od vodećih problema jeste finansiranje sigurnih kuća. Finansiranje sigurnih kuća predviđeno je iz budžeta Republike Srpske u iznosu od 70%, a iz budžeta jedinica lokalne samouprave 30%. Međutim, sigurne kuće ne dobijaju dovoljno sredstava. U FBiH je takođe neriješen status za finansiranje iz javnih budžeta. Pozitivan korak predstavljaju SOS telefoni za prijavu nasilja u oba entiteta.

Konvencija Vijeća Evrope za prevenciju i borbu protiv nasilja nad ženama i nasilja u porodici (Istanbulska konvencija), čiji potpisnik je i Bosna i Hercegovina, obavezuje države da osiguraju dovoljan broj sigurnih kuća za žrtve rodno zasnovanog nasilja i nasilja u porodici. Cilj konvencije jeste nulta tolerancija na nasilje. Konvencija prepoznaje nasilje nad ženama, kao strukturalno nasilje, koje je manifestacija istorijskih nejednakih odnosa moći između žena i muškaraca. Svrha konvencije je zaštita žena od svih oblika nasilja, sprečavanje, procesuiranje i eliminisanje nasilja prema ženama i nasilja u porodici (Istanbulska konvencija).

Bitno je napomenuti, da je u Republici Srpskoj usvojen i Nacrt zakona o zaštiti nasilja u porodici i nasilja prema ženama, kao potreba da se izvrši usklađivanje sa međunarodnom regulativom, poboljša i unaprijedi pravna regulativa, da se uspostavi koordinisano djelovanje nadležnih institucija, prepozna svaki oblik nasilja i daje veća zaštita ženama žrtvama nasilja. Ovim nacrtom zakona definisan je femicid, kao najteži oblik i posljedica nasilja prema ženama, koji predstavlja svako lišenje života žene izvršeno u potpunosti ili djelimično, zbog njene pripadnosti ženskom polu ili smrt žene koja je posljedica radnji nasilja prema njoj, bez obzira na to da li je za to osumnjičeni za radnje nasilja član porodice ili drugo lice. Na ovaj nacrt iznesene su brojne kritike od toga da definicija femicida nije adekvatna za tradicionalne porodične vrijednosti odnosno da zakon propagira rodnu ideologiju, ispolitizovani termin kako bi se opravdala ograničenja prava žena i LGBT osoba. Shodno tome, vlast u Republici Srpskoj inicirala je izmjene Krivičnog zakonika kojim se briše rodni identitet kao zaštićena karakteristika iz svih odredbi zakonika. Ustavni sud je utvrdio da riječ „gender“ nije u skladu sa Ustavom jer ne pripada nijednom od jezika koji su u zvaničnoj upotrebi (Ustavni sud Republike Srpske, 2024).

U BiH ne postoji zvanična statistika o broju žrtava femicida, a jedan od razloga za to je i što femicid nije predviđen kao zasebno krivično djelo. Statistička vidljivost bila bi značajna jer bi omogućila preciznije praćenje ovih slučajeva, te mapiranje i razvoj odgovarajućih mjera. Takođe, omogućilo bi se jasnije prepoznavanje specifičnosti ubistava žena zbog njihovog roda. Bitno je napomenuti da je inkriminacija femicida kao posebnog krivičnog djela u nacionalnom zakonodastvu opravdana i neophodna**.** Stanje u bh. društvu, ali i globalna dešavanja nam pokazuju da nikada ne smijemo prestati pričati o ljudskim pravima ženama. Time se stavlja naglasak na činjenicu da su i žene ljudi, da se rađaju slobodne i jednake u dostojanstvu i pravima, da nisu samo dio nekog drugog bića, dio bez kojeg se može.

ZAKLJUČAK

Feminizam sa svojim postulatom „privatno je javno (političko)" i djelovanje ženskih pokreta koji su se u toku i nakon rata bavili nasiljem nad ženama učinili su ovo pitanje „javnim problemom" i „primorali" političku vlast u BiH da se konkretnije bavi zakonskim rješavanjem nasilja nad ženama. Nažalost, građanski rat bio je klica i za jačanje femicida u poslijeratnom periodu. Budući da je nacionalno-patrijarhalna paradigma i danas dominantni model funkcionisanja našeg društva, jačanje uloge feminizma u obrazovanju, kulturi, politici, uopšte u društvenom diskursu, jedan je od preduslova uspješne prevencije i zakonskog rješavanja nasilja nad ženama.

S obzirom na iznesene alarmantne podatke o broju ubijenih žena u BiH, neophodna je hitna izmjena postojeće zakonske regulative. Bitno je kao prvi korak jasno definisati, inkriminisati u krivičnom zakoniku femicid kao zasebno krivično djelo ili ubistvo ženske osobe, kako se ne bi stvarao prostor za različita tumačenja. Potrebno je izraditi jasne smjernice o procesuiranju femicida, naročito u pogledu kvalifikacije krivičnog djela i utvrđivanja da li je u pitanju rodno zasnovano krivično djelo. Prvenstveno je neophodno propisati adekvatnu sankciju i izvršiti pooštravanje postojeće kaznene politike, a preduslov za sve navedeno je rad na promjeni svijesti o nasilju nad ženama, što je zadatak društva kao cjeline.

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THE ROLE OF FEMINISM AND THE STRENGTHENING OF LEGAL FRAMEWORK ON VIOLENCE AGAINST WOMEN IN BOSNIA AND HERZEGOVINA

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ABSTRACT

Violence against women is identified as a constant characteristic of Bosnia and Herzegovina's society, with an increasingly prominent tendency for femicide to become its constant as well. In the first part of the paper, the significance of feminism as a segment of ideological political discourse influencing the legislative activity of political authorities is analyzed, but also the society in general in its relationship to and fighting violence against women. The specificities of feminism, the history and the development of the women's movement in Bosnia and Herzegovina have been indicated, with the focus on insufficient acceptance, appreciation and inclusion of feminism into the political life of our society.

A family as the basic cell of society is seriously endangered nowadays, considering the increase in the number of domestic violence where the woman is most often the victim. Consequently, in the context of domestic violence, the second part of the paper deals with the issue of violence against women, primarily femicide, from the legal aspect. The aim is to point out the importance of femicide incrimination and adequate legal protection of women, with the aim of preventing femicide, treatment and punishment of the perpetrator.

Keywords: femicide, feminism, Bosnia and Herzegovina.

ФИНАНСИРАЊЕ ЗДРАВСТВЕНИХ УСТАНОВА ИЗ СРЕДСТАВА ОБАВЕЗНОГ ЗДРАВСТВЕНОГ ОСИГУРАЊА РЕПУБЛИКЕ СРПСКЕ

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АПСТРАКТ

Постојање ефикасног система јавне здравствене заштите у друштвеној заједници је особина квалитетне социјалне цјелине и мјера квалитета живота становништва. Као и за сваки други подсистем државе, неопходно је финансирање одрживог развоја здравственог система.

Рад садржи анализу модела којима се из средстава обавезног здравственог осигурања врше плаћања здравственом систему и даваоцима услуга, уз приказ постојећих система плаћања трошкова. У ту сврху је проведено истраживање компарацијом историјских података трошкова јавне здравствене заштите, те анализом трендова.

Циљ рада је истражити и одабрати адекватне моделе за плаћање здравствених услуга, ради избора између неколико модела развијених у ту сврху. Приказан је и начин финансирања здравствене заштите у Републици Српској, као и износи у посматраном периоду. Закључци о трендовима су потврдили да су трошкови лијечења за које држава издваја новац за задравствени систем све већи, уз истовремено све мањи број осигураних лица, те се и поред релативно високог просјечног издвајања за лијечење још увијек издвајају знатни износи личног плаћања услуга и лијекова који нису доступни из обавезног здравственог осигурања, или су тешко доступни кроз редовне процедуре лијечења.

Кључне ријечи: здравствена заштита, здравствено осигурање, трошкови здравствене услуге, модели финансирања

УВОД

У савременом друштву занимљива је појава раста, развоја и све већег значаја здравства и здравственогситема. Примјеном здравственог менаџмента, здравство је добило нове импулсе за значајне процесе у својој дјелатности, а који су здравство приближили потреби управљања здравственим системом на нов и ефикаснији начин. Улагања у здравствени систем су растућа, а функционисање и рад здравственог система су све скупљи и сложенији. Циљ управљања здравственим системом је утицај на смањење трошкова уз давање што квалитетније услуге. Трошкови који настају функционисањем здравствене установе обухватају покривање издатака насталих давањем услуга особља, лијекова, медицинских средстава и помагала, боравка у установама итд.

Здравствени систем се може дефинисати као дио општег система односно један од његових подсистема чији је главни задатак унапређење и очување здравља. Са општим друштвеним развојем јача и развој здравственог система и његовог значаја и улоге у општем развоју. Од некада слабог или малог подсистема, он све више постаје подсистем који се не може занемаривати (Мићовић, 2008, стр.4; Јовановић, Миловановић, Мандић и Јововић, 2015; Crnčević, & Krstić, 2008).

Као и сваки други систем, здравствени систем захтијева изворе финансирања без којих је немогуће његово функционисање и постизање задатих циљева. С тим у вези се појављују различити модели финансирања здравства, у зависности од тог који специфични модел је држава одабрала. Исто отвара низ питања и одговора, од којих зависи успјех здравственог система, у краћем и у дужем периоду. Носиоци функције одлучивања и менаџери који проводе одлуке имају задатак да се ресурси намијењени за развој здравства користе на што ефикаснији и рационалнији начин. У те сврхе се користе различити модели финансирања и оцјене рада здравствене установе.

На другој страни је тежња ка све сложенијим и скупљим медицинским процедурама, доступним у мањим центрима живљења, те стални раст укупних трошкова лијечења. Посматрајући такав тренд, економски резон је усмјерен на смањење непотребних трошкова и издатака у здравству. Импулс за смањење трошкова може доћи од државе, која жели да смањи издатке за јавно здравство, а које тиме индиректно и контролише неопходно. И даваоци услуга се воде принципом економичности, јер смањењем својих трошкова пословања индиректно повећавају профит.

Међутим, како је у питању јавно добро, уз корист очувања здравља друштва, принцип економичности треба опрезно проводити уз праћење индикатора стања здравља становништва. У сваком случају, за пружене здравствене услуге мора да се плати адекватна новчана накнада, а начини на који се утврђује висина накнаде, тј. цијене, су различити. Развијени су различити модели плаћања услуга у зависности од купца услуге. Из потребе тачног утврђивања стварне цијене коштања здравствене услуге, изведен је низ модела за одређивање цијена и трошкова из чега су настали цјеновници здравства. На основу цјеновника настали су модели за плаћање услуга, с обзиром на то да су поједине услуге неодвојиве од пратећих услуга, материјала, лијекова и сличног.

У ту сврху, у раду су кориштене методе за приказ постојећих модела финансирања здравственог система, анализу и поређење различитих модела, истраживање примијењених модела финансирања и друге. С тим у вези је и структура рада, која полазећи од општих појмова о здравственом систему, прелази на приказ и анализу трошкова здравствене заштите, те апликативних модела плаћања здравствених услуга.

Анализа финансирања здравственог система обухвата (Павић, 2007, стр. 49):

1. Теоријски приступ финансирању здравства проучава економске функције у унутрашњости здравственог система, што истовремено подразумијева спајање двије врсте менаџмента. Здравствени менаџмент и финансијски менаџмент се комплементарно срећу у циљу управљања финансијским средствима намијењених здравственом систему.

2. Други или систем-специфични приступ означава прикупљање финансијских средстава за здравствени систем. Овај систем спаја државне фондове

са додатним фондовима, често приватне природе, као и друге агенције и установе које су повезане са финансирањем здравственог система.

3. Емпиријски приступ подразумијева унапређење и напредак здравствених потреба, а све с намјером да се ријеше здравствени проблеми становништва. Такође, овај приступ контролише медицинске и финансијске елементе који одржавају ниво здравља. Веома је важно да се адекватним финансирањем обезбиједи сигурна здравствена заштита и очување здравља становништва.

Средства у новчаном облику потребна за функционисање здравства могуће је набавити из више финансијских извора, од којих су најважнији: буџет друштвене заједнице, обавезно здравствено осигурање, приватна и лична здравствена осигурања, директно плаћање корисника услуга, дотације локалне заједнице, донације и помоћи.

ОБАВЕЗНО ЗДРАВСТВЕНО ОСИГУРАЊЕ КАО ИЗВОР ФИНАНСИРАЊА

У систему обавезног здравственог осигурања постоји обавезност пријаве на здравствено осигурање, установљене од стране државе. Овај модел је још доста заступљен у бившим социјалистичким државама, али је у међувремену проширен тако што обавезност здравственог осигурања остаје непромијењена, а остварује се по избору корисника преко државног осигурања или приватних осигуравајућих кућа.

Услов за ефикасно функционисање успостављеног здравственог система је довољност обима новчаних средстава која се прикупљају на порески начин, и усклађеност са расходима за здравствену заштиту на нивоу државе. Наведена усклађеност често не постоји, јер су потребе и издаци за здравље и здравство скоро неограничени.

Број осигураника у години 2020. показује значајно одступање од тренда, јер је претходно укинуто осигурање по основу незапослености, али је због епидемије вируса КОВИД дато право на здравствено осигурања свим становницима Републике Српске (Табела 1 и Табела 2).

Систем обавезног осигурања захтијева евиденције у којима су сви потенцијални корисници давања из здравственог осигурања. Начин и распоред уплата су дефинисани посебним законима, као што је Закон о доприносима Републике Српске, а висину стопе доприноса одређује држава. Стопа доприноса може да варира, али сав новац прикупљен у наведену сврху мора бити намјенски искориштен. Није дозвољено његово неоправдано чување, шпекулативно улагање, нити несврсисходно трошење. Разлог оваквог поступања заједнице је постизање хуманости за угрожене становнике, уз избјегавање ризика евентуалног ширења обољења на здраво становништво, због чињенице да је неко ко је болестан остао без потребне здравствене заштите.

Табела 1: Потрошња и број осигураних лица Фонда здравственог осигурања Републике Српске у периоду 2017–2022. године
Table 1. Consumption and number of insured persons of the Health Insurance Fund of the Republika Srpska in the period 2017–2022

Година	2017.	2018.	2019.	2020.	2021.	2022.
Укупни трошак КМ	788.875.776	797.863.275	820.067.626	884.943.129	945.841.706	1.035.198.003
Број осигураних лица	913.725	910.484	907.770	850.356 (909.356)	857.133	900.460
Просјечни трошак по осигураном лицу КМ	71,98	73,02	75,28	81,10	91,96	95,80

Извор: рад аутора, према подацима Фонда здравственог осигурања Републике Српске, објављеним у Службеном гласнику Републике Српске.

Табела 2: Структура расхода Фонда здравственог осигурања Републике Српске у периоду 2017–2022. година, у КМ
Table 2. Expenditure structure of the Health Insurance Fund of the Republika Srpska in the period 2017–2022, in BAM

Година	2017.	2018.	2019.	2020.	2021.	2022.
Примарна здр. заштита	228.324.908	235.886.174	234.456.086	214.367.420	234.016.204	272.848.498
Секундарна и терцијарна здравствена заштита	341.045.833	360.851.119	362.574.920	404.191.164	451.839.728	491.287.688
Лијекови на рецепт	109.517.243	106.089.220	124.509.551	130.097.531	137.519.727	151.715.187
Ортопедска средства	8.081.944	7.845.044	8.413.178	7.522.089	8.539.387	9.234.839
Превоз у болницу	2.964.612	3.829.439	3.660.021	3.318.730	3.746.464	4.135.196
Остали облици здр. заштите	4.566.529	4.481.253	5.272.929	5.020.489	7.904.036	7.884.663
Накнаде боловања	12.202.520	13.341.998	16.295.414	17.547.036	18.424.261	17.383.442
Трошкови провођења здр. заштите	27.940.618	27.549.172	25.909.342	28.487.533	28.102.229	31.890.077
Остали расходи	51.591.813	37.549.856	38.426.185	73.891.137	55.749.706	48.818.408

Извор: рад аутора, према подацима Фонда здравственог осигурања Републике Српске, објављеним у Службеном гласнику Републике Српске

МОДЕЛИ ПЛАЋАЊА ЗА ИЗВРШЕНЕ ЗДРАВСТВЕНЕ УСЛУГЕ

Стварање и увођење у употребу модела плаћања за пружене здравствене услуге има широку историју настанка. Разлози настанка модела плаћања се налазе у све већој сложености здрвствених система, начину кориштења здравствених услуга, ограниченим средствима за плаћање скупих здравствених услуга уз растуће цијене здравствених услуга. На тим основама су развијене тзв. схеме плаћања усклађене са друштвеним системом у којем постоје, а најчешће заступљени модели плаћања су:

- плаћање преко плата,
- плаћање за пружене услуге,
- плаћање према капитацији,
- плаћање дијагностички сродних група,
- плаћање по болничком дану,
- плаћање по буџету,
- комбиновани модели плаћања.

Плаћање преко плата

Плаћање здравствених услуга преко плата љекарима базирано је на принципу да се љекару надлежном за становништво једне области исплаћује државна плата за вријеме ангажмана, као лицу задуженом за здравље становништва. При одређивању буџета за једно подручје узима се у обзир више фактора, али је поред капитације битна и старосна структура становништва регије. Надлежни љекар може бити и оспособљен за секундарни ниво здравствене заштите, а истовремено обавља и послове примарне заштите, при чему добија новац за оба типа услуге.

Медицинске услуге су једнаког квалитета за све становнике подручја, а једноставност система плата омогућава контролу трошкова. Мали је интерес за побољшање квалитета услуге и услова пружања услуге јер плата љекара није у вези са квалитетом.

Плаћање за пружене услуге

Систем плаћања по пруженој здравственој услузи значи плаћање по укупној количини услуга које је пружио давалац *(Fee for Service)*. Овај модел се сусреће на примарном нивоу здравствене заштите (нпр. у САД и Белгији) гдје су љекари самостални субјекти.

Позитивне стране су широка доступност и квалитет услуга, али је могуће да љекари пруже више услуга него што је објективно потребно, а бирају се услуге на којима се више зарађује, као и захтјевнији корисници. Ово иницира посебно управљање трошковима и интензивну контролу пружања и сврсисходности услуга.

Плаћање према капитацији

Плаћање према капитацији је плаћање по глави корисника услуга здравственог система. Користи се на примарном нивоу заштите за плаћање изабраног породичног љекара код којег су регистровани корисници, по коефицијентима за број, старост и друге битне особине. Љекари имају интерес да покривају што већи број корисника услуга, а са што бољим здравственим стањем и мањом старости.

Моделом се постиже приступачност љекара, фаворизује повећање броја корисника, али се занемарује квалитет услуге и избјегава слање у другу здравствену установу, како би што више новца остало у надлежној установи.

Плаћање дијагностички сродних група (ДРГ- *Diagnostic Related Groups*)

Плаћање по систему дијагностички сродних група се појавило у САД-у 1980-их година, а убрзо је прилагођено примијењено у земљама са другачијим начином финансирања здравственог система, а већ деценију се користи у Републици Српској. Модел се највише користи на секундарном нивоу здравствене заштите, а први корак чини одређивање улазне дијагнозе пацијента и сврставање у групу пацијената по сличностима које љекар уочи, те сврставање у одговарајућу ДРГ групу, која носи унапријед одређену цијену за болницу.

Сврха модела је контрола трошкова, јер је претходно кориштени модел БОД узроковао непотребно задржавање пацијената у болници. Моделом ДРГ предвиђа се потребна количина лијека, санитетског материјала, помоћних средстава, дана лежања, контроле и сл. Пријевремено отпуштање болесника кући и бирање пацијената са дијагнозама са повољним ДРГ коефицијентом повећали су потребу појачане контроле рада установе.

Плаћање по болничком опскрбном дану (БОД)

Модел плаћања по БОД примјењује се за болнице и све мање је у употреби, али се користи за одређене дјелатности (нпр. хронична психијатрија, геријатрија...). Један БОД садржи све трошкове који се паушално обрачунавају у договореној цијени дана лежања у болници секундарног нивоа, без других трошкова.

Модел је настао из потреба пацијената током вишедневног боравка у болници, али је узроковао и непотребну дужину болничког лежања пацијената.

Плаћање по унапријед одређеном буџету

Буџетски модел је настао из потребе ефикасног управљања и трошења релативно мале количине новца. Уочава се постојање фиксне количине новца намијењене за посебне врсте лијечења. Разлог за примјену оваквог начина плаћања је неумјерено издавање рачуна за лијечење пацијената, који су лијечени на терет буџета када и није постојала потпуна медицинска оправданост.

Кључна компонента је планирани буџет, који може бити недовољан и нефлексибилан, те ограничава квалитет пружања здравствених услуга. Услуге овог типа се недовољно усавршавају и технолошки заостају, јер буџети нису флексибилни за плаћање развоја.

ОСОБИНЕ МОДЕЛА ФИНАНСИРАЊА ЗДРАВСТВЕНЕ ЗАШТИТЕ У РЕПУБЛИЦИ СРПСКОЈ

Ради уједначавања услова рада и доступности здравствене заштите, комбинују се модели плаћања према циљевима здравственог система. Комбиновање модела плаћања је честа појава и унутар једне здравствене установе, према врсти датих услуга. Избор добре комбинације модела плаћања није фиксна категорија, јер се промјенама утицајних фактора отварају могућности другачијих комбинација модела.

Здравствена установа обезбјеђује средства за рад на сљедећи начин:

- од организације здравственог осигурања,
- из буџета,
- од продаје услуга и производа,
- обављањем научноистраживачке и образовне дјелатности,
- од промета робе,
- од издавања под закуп слободног капацитета,
- од легата, поклона, завештања, и из других извора.

Здравствена установа и сва друга правна и физичка лица која обављају здравствену дјелатност стичу средства за рад извршењем програма здравствене заштите према врстама, обиму и квалитету здравствених услуга који се вреднују цијенама појединачних услуга, програма у цјелини или по становнику, односно броју опредијељених грађана. Цијене појединачних услуга, односно програма утврђују уговором здравствена установа, односно друга правна и физичка лица која обављају здравствену дјелатност и организација за здравствено осигурање (Драгић, 2018, стр. 79; Митровић и Гавриловић, 2013).

Плаћање трошкова здравствене заштите по уговорима здравствених установа са јавним Фондом здравственог осигурања врши се у комбинацији модела коју чине:

Модел 1: финансирање према учинку сразмјерно пруженим услугама по појединачним епизодама лијечења, а обухвата услуге акутног болничког лијечења, интензивне његе и услуге пружене у дневној болници;

Модел 2: финансирање по појединачним услугама и релативној вриједности бода; обухвата услуге специјалистичко-консултативне здравствене заштите и дијагностике пружених амбулантно, а средства по уговору се остварују на основу броја и вриједности пружених услуга и израчунате релативне вриједности бода;

Модел 3: финансирање по уговореној цијени која не може бити већа од цјеновника Фонда, а обухвата услуге пружене на основу конзилијарног мишљења или препоруке доктора специјалисте одређене гране пружене уз ангажман стручњака;

Модел 4: финансирање по буџетском систему на основу фиксно уговореног износа на годишњем нивоу за услуге пружене амбулантно и лежећим пацијентима за услуге стационарне рехабилитације (трансфузијска медицина, рехабилитација, физикална медицина, стоматологија, психијатрија, нуклеарна медицина).

Плаћање за здравствене услуге пружене из обавезног здравственог осигурања се више од десет година у Републици Српској пружа на основу комбинације модела за плаћање. Циљ модела је да се даваоци услуга финансирају по основу учинка и стварних резултата рада, а не на основу броја регистрованих корисника. На тај начин је добијена значајна прераспodjела припадајућег новца у корист установа које су пружиле већи број услуга лијечења, а мотивишу се даваоци за виши квалитет рада и бољи однос према кориснику, чиме се постиже да „новац иде за пацијентом“.

Постоји више разлога који су утицали на релативно касно увођење плаћања по моделима (Кузмановић, 2017, стр. 83):

- Плаћање по моделу БОД стварало је злоупотребе због неоснованог задржавања болесника ради остваривања већег броја болничких дана,
- Увођење модела ДРГ је сложен вишефазни поступак,
- Потребна свеобухватна едукација за кодирање,
- Откуп лиценци за класификацију дијагноза и процедура,
- Потребна снажна информатичка инфраструктура.

Полазећи од прихваћених оцјена да успостављање здравствене политике на реформском курсу подразумијева савремену организацију рада, чисте односе и слободну конкуренцију знања, квалитета, ефикасности и продуктивности, веома је важно схватити, да су за успостављање таквих односа неопходне, поред осталог, стандардизоване процедуре, поуздане, тачне и контролисане базе података и квалитетне информације, као и руководећи кадар који то све треба да обезбиједи и користи у процесу управљања, руковођења и одлучивања (Довијанић, 2003, стр. 352). Фонд контролише извршење уговорених услуга увидом у пословну, медицинску и другу документацију. Ако се у процесу контроле утврди да је здравствена установа извршила неправилно извјештавање, може се примијенити уговорна казна.

ИЗЈАВА О ИНТЕРЕСИМА

Аутори потврђују да не постоје сукоби интереса за изјашњавање у вези са истраживањем представљеним у овом раду.

ЗАКЉУЧАК

Развијен здравствени систем није проналазак савременог друштва, али су се мијењали начини на који се систем одржава у функцији, јер је општа брига за здравствено стање становништва и даље основни мотив ангажовања великих износа новца за финансирање здравствене заштите. Како су могућности трошења новца у здравствене сврхе неограничене, немогуће је потпуно покриће свих трошкова здравствене заштите. Уз све веће могућности лијечења које нуди савремена медицинска наука, уочљив је велики скок цијена рада особља, лијекова, медицинских средстава и опреме.

Функционисање здравственог система захтијева све веће износе новчаних средстава, као и развијене моделе плаћања за пружене здравствене услуге, а финансијски менаџмент здравствене установе постаје све важнији сектор у организацији. Подаци о приходима и трошковима су потребни на дневном нивоу, што захтијева солидну информатичку подршку. Међутим, све ово захтијева значајна улагања у људе, опрему, образовање, објекте, квалитетне материјале, нове процедуре итд.

С друге стране, развијени су диференцирани модели плаћања од стране великих купаца здравствених услуга (државе, компаније, осигурања) за пружене здравствене услуге. Примјена различитих модела групног плаћања за различите категорије услуга се показала као широко прихваћен и прилично успјешан начин усаглашавања интереса купаца и давалаца медицинских услуга, а избјегнуте су слабости појединачног и „чистих“ модела плаћања услуга, те спријечене злоупотребе указаног повјерења.

Без обзира на изабрани модел, начин и изворе финансирања трошкова рада здравствених установа, позитиван пословни резултат уз постизање добре конкурентске позиције и пожељности код корисника услуга остају универзални принципи и у здравственом сегменту друштва.

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FINANCING OF HEALTHCARE INSTITUTIONS FROM THE OBLIGATORY HEALTH INSURANCE IN THE REPUBLIC OF SRPSKA

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ABSTRACT

The existence of an efficient system of public health care in the social community is a characteristic for a quality social entity and a measuring element of the life quality in a population. Like any other sub-system in the state, it is necessary to finance the sustainable development of the public health system. The paper contains an analysis of several payments models from the funds of the obligatory health insurance to the health system and health service providers, with a presentation of the existing systems and models of covering costs. For this purpose, research was conducted by comparing historical data on health care costs and analyzing their trends. The aim of the paper is to research and select adequate financing models for provided health services, which is the job of managers in health care, in order to choose between several models developed for this purpose. The manner in which health care costs are settled in the Republic of Srpska, as well as the amounts in the observed period, is also shown. Conclusions on trends confirmed, that the costs of medical treatments, for which the state allocates money for the health care system, are increasing. At the same time, it was observed that the number of insured persons is decreasing, and that despite the relatively high average allocation for treatment per capita, considerable amounts of direct personal payment for services and medicines are still high, which are either not available from obligatory health insurance, or are difficult to access through regular procedures. Keywords: health care, health insurance, medical costs, financing models.

Keywords: health care, health insurance, medical costs, financing.

GUIDELINES TO AUTHORS FOR WRITING PAPERS

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ABSTRACT

Guidelines to the authors on the manner of preparation of the article are designed in accordance with the best world publishing practice and the Rulebook on publishing scientific publications (Official Gazette of the Republic of Srpska, No. 77/17). The instruction was created in order to unify the style of publishing articles in all issues and editions of the scientific magazine "STED JOURNAL". The magazine is published semi-annually (May-November) in printed versions, with a circulation of 200 copies, and the electronic version of the issue is published at https://stedj-univerzitetpim.com/. All articles must be formatted in accordance with this Instruction and delivered to the email address of the journal. Each paper undergoes a preliminary elimination review, after which it is rejected or referred to the blind review process by two independent reviewers. Papers that have at least two positive reviews are published in the journal. The list of reviewers is adopted by the Editorial Board of the journal. The identity of the reviewer is not revealed to the authors and vice versa.

Keywords: STED Journal, review, publication, scientific publications

GUIDELINES TO AUTHORS FOR WRITING PAPERS

The guidelines to authors consist of two parts. The first part is related to the content aspect of the paper, that is, its necessary basic elements, based on which the reviewers evaluate the content adequacy of the paper. The second part of the guidelines is related to the technical aspect of formatting the paper based on which the editorial board, after receiving the paper, decides whether to send the paper to be reviewed or return it to the author to be finished before reviewing.

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- Review scientific article,
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- Scientific critique,
- Professional article.

Authors suggest the category of their papers, but the final decision is made by the Editorial Board and reviewers.

Original scientific paper is a paper which is basically organised according to the IMRAD scheme (Introduction, Methods, Results and Discussion) for experimental research or in a descriptive way for descriptive scientific fields, in which one for the first time publishes the text on results of their own research carried out applying the scientific methods, which are described textually and which enable that the research is repeated in case of need, and the established facts are checked.

Review scientific article represents a review of the latest papers of a certain subject field, with the aim to summarise, analyse, synthesise and evaluate the information already published, and moreover it brings new syntheses which also necessarily include the results of the author's own research.

Short or preliminary communication is an original scientific paper, but of a less extent or preliminary character, in which some elements of the IMRAD can be omitted, and it is about summarised presenting the results of a finished original research paper or article which is still in development (Working Paper).

Scientific critique, that is, a polemic or overview is a discussion to a certain scientific topic based specifically on scientific argumentation, in which the author proves the correctness of a certain criterion of their opinion, that is, they confirm or reject other authors' findings.

Professional paper is a contribution in which experience useful for improving the professional practice is offered, but which is not necessarily based on a scientific method, that is, the emphasis is on the usability of the results of original research and on spreading knowledge, and the text has to be adjusted to the professional and scientific level of the professional community for who the paper is intended.

The papers classified into these categories are subject to review by two reviewers. Reviews are double-blind, the authors' identity is not revealed to the reviewers and vice versa. The paper shall be published only based on positive reviews about which the Editorial Board shall inform the author. The reviewers are selected among experts in the direct field of research to which the paper submitted for publication is related.

The STED JOURNAL can include contributions from conferences, congresses, consultations and symposia.

The author is fully responsible for the content of the paper. The Editorial Board assumes that before submitting the paper the authors regulated the issue of publishing the content of the paper pursuant to the rules of the institution or company where they work.

The speed of publishing the paper will depend on how much the manuscript (text) complies with the guidelines. The papers requiring major modifications and amendments shall be returned to the author to be revised before reviewing.

TECHNICAL GUIDELINES

The paper shall be sent to the Editorial Board of the journal by e-mail in the form of a text prepared specifically using the text processing program of Microsoft Word.

The paper should consist of the following elements in English:

- Title of the paper;
- List of the authors and institutions;
- Abstract;
- Key words;
- Introduction;
- Theoretical framework;
- Experimental part;
- Results and discussion;
- Conclusion;
- Literature overview.

The title of the paper should be centred and written in upper case, Times New Roman, 14 pt, bold, Caps Lock;

The authors should be written in the centre, without titles, Times New Roman, 12pt, normal, and the names of institutions centred, Times New Roman, 10 pt, normal.

The titles of a part of the paper– of the first level, left alignment, Times New Roman, normal, 12 pt, bold, Caps Lock;

The subheading – of the second level, left alignment, lower case, Times New Roman, 12 pt, bold;

The subheading – of the third level, left alignment, lower case, Times New Roman, 12 pt, *italic*.

Other parts of the paper should be written using the alignment on both sides (Times New Roman, 12 pt), one-sided spacing with one empty row above, between the subheadings and paragraphs, with margins of 2.54 cm (1"). The beginning of the paragraph should be typed at the beginning of the row.

The abstract should have 100-250 words, and it is positioned between the paper heading (consisting of the paper title and information on authors) and key words, which are followed by the text of the paper.

If the paper is written in one of the official languages of Bosnia and Herzegovina, the summary in English is given in an extended form, as a so-called resume and it should consist of up to 500 words.

Tables and charts

Tables should be prepared in the WORD, graphics in the EXCEL, except for some special cases when it is not possible technically. Tables and graphics should be clear, as simple as possible and transparent. The title, heading (text) and subtext in tables and graphics should be written in Times New Roman – normal, Font Size 10 pt. Tables should be placed at a certain place in the text. Tables should not include more than ten columns and more than fifteen rows. If the author assumes that data should be presented in a larger number of columns and rows, it is necessary to split the content of the table into two or more smaller tables or deliver it as a special attachment. They have to be drawn according to the computer template (Insert Table), and not using the spacing, dots and tabs. When citing tables and graphics, we write the title of the table or graphic in the initial capital letter and then we specify its ordinal number (e.g. as it is shown in Table 9 and Figure 6, the lowest value was...).

A table example:

Table 1 The curing data for NR/CSM rubber blend compounds with different content of waste rubber powder

WRP content (phr)	**Curing characteristics**					
	M_l, dNm	M_h, dNm	ΔM, dNm	t_{s2}, min	t_{c90}, min	*CRI*
0	4	40	36	6	15	11.0
20	5	42	37	8	16	12.5
40	5	45	40	9	16	14.3
60	7	46	39	9	17	12.5
80	7	47	40	10	17	14.3
100	7	47	40	10	17	14.3

A chart example:

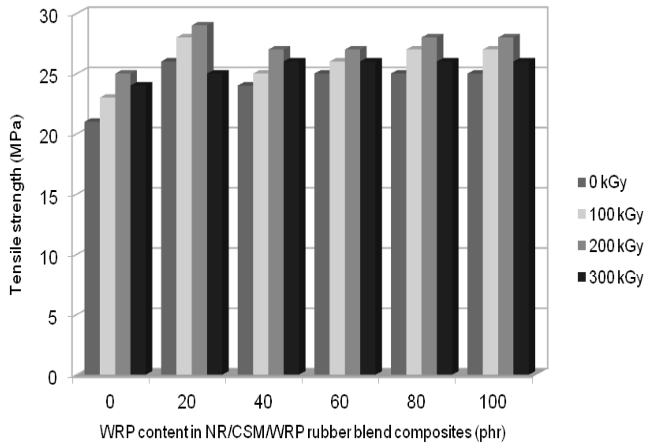

Figure 1 The effect of waste rubber powder content on tensile strength for the NR/CSM/WRP composites irradiated with different doses.

Equation

Equations should be written in the graphic editor for equations, specifically in the Microsoft Equation and they should be placed at the beginning of the text. On the right edge of the text in the row in which the equation is written one should indicate its number in parentheses beginning with number 1.

$$m_r = m_s\left(1 - e^{k_s t_{maks}}\right) - m_d\left(1 - e^{-k_d (t - t_{maks})}\right) \; za \quad t > t_{maks} \qquad (1)$$

Figures

Figures have to be prepared for black-and-white printing, that is, if the original figure is in colors which cannot be distinguished in black-and-white printing, the colors have to be replaced by "raster", that is, different graphic signs which need to be explained in the legend. We insert in figures only the most essential text necessary for understanding, such as measure variables with their dimensions, short explanation on curves and similar. The rest is stated in the legend under the figure (Figure 2). The maximum size of a figure is 13 cm x 17 cm.

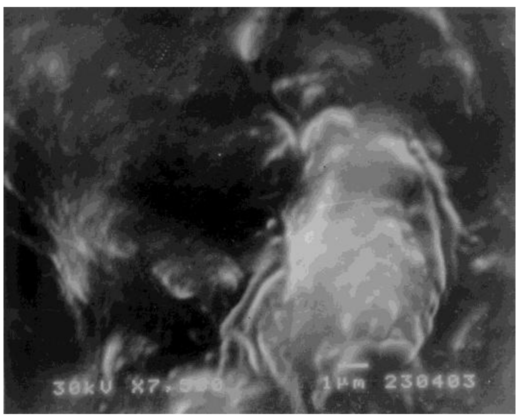

Figure 2 The SEM micrograph of NR/CSM/WRP composites filled with 20 phr waste rubber powder at 7500X magnification.

Other notes

In order to include successfully the papers published in one of the official languages of Bosnia and Herzegovina into international information flows, parts of the manuscript should be written both in the author's language and in English, including: text in tables, figures, diagrams and drawings, their titles and symbols.

About authors

When sending the paper one should give their full official address, telephone number and e-mail of all authors and emphasize the author with who the Editorial Board shall cooperate. These notifications should be submitted on a separate sheet.

Experimental technique, symbols and units

Experimental techniques and devices are described in detail only if they deviate significantly from the descriptions already published in the literature. If techniques and devices are familiar, only the source of necessary notifications is stated.

Symbols of the physical quantities should be written in Italic (Times New Roman, 12 pt. – italic), and units of measurement in upright letters, e.g. V, m, p, t, T, but m^3, kg, Pa, °C, K. Quantities and units of measurement have to be used pursuant to the International System of Units (SI).

LITERATURE

The reference list at the end of the article has to include only the sources which the author referred to in the article text. The used literature items are listed in alphabetical order. Left 0", Right 0", Hanging 0.3", Before 0", After 0", Single. Primarily use journal references (minimum 50%, preferably more than 80%).

Examples of citing

An example of citing a scientific journal

The general form for citing papers from the journal is as follows: author's surname [comma], initial of first name(s) [dot], [open small bracket] year of publication [closed small bracket] [dot] title of the paper [dot], journal title - italic [comma] volume number - italic [open parenthesis] issue number [closed parenthesis] [comma] start page [dash] end page [dot].

In the text:

When the author(s) are mentioned in the sentence and his/her words are stated, then after the author's name the year of publication of the cited work and the page number in brackets are stated:

- one author: (Avramović, 2011);
- two authors: (Žiravac-Mladenović i Đurica, 2018);
- three to five authors: first citing in text: (Mitić, Nikolić, Cakić, Nikolić, & Ilić, 2007); second and every next citing in text: (Mitić et al., 2007);
- six and more authors: (Špírková et al., 2009).

In the reference list:

Avramović, D. (2011). Metode i okviri rasta vrijednosti banke. *Analі poslovne ekonomije, 5*(1), 28-37.

Žiravac-Mladenović, M. i Đurica, F. (2018). Komparativna analiza trgovanja na Banjalučkoj i Sarajevskoj berzi. *Anali poslovne ekonomije, 10*(1), 25-35.

Mitić, Ž., Nikolić, G., Cakić, M, Nikolić, R., & Ilić, LJ. (2007). The investigation of Co (II)- dextran complexes. *Hemijska industrija, 61*(5), 257-262.

Špírková, M., Strachota, A., Urbanová, M., Baldrian, J., Brus, J., Šlouf, M., Kuta, A. & Hrdlička, Z. (2009). Structural and surface properties of novel polyurethane films. *Materials and Manufacturing Processes, 24*(10-11), 1185-1189.

An example of citing a book in the text:

- one author: (Suzić, 2010);
- two authors: (Peterlin i Mladenović, 2007);
- three to five authors: first citing in text: (Đuranović, Todorović i Tešić 2016); second and every next citing in text: (Đuranović et al., 2016);
- six and more authors: (Stefanović et al., 2008).

In the reference list:

Suzić, N. (2010). *Prvila pisanja naučnog rada: APA i drugi standardi.* Banja Luka: XBS.

Peterlin, J. i Mladenović, M. (2007). *Finansijski instrumenti i menadžment finansijskih rizika.* Banja Luka: Univerzitet za poslovni inženjering i menadžment.

Đuranović, D., Todorović, S. i Tešić, R. (2016). *Strategijski menadžment.* Banja Luka: Univerzitet za poslovni inženjering i menadžment.

Stefanović et al. (2008). *Kretanje šinskih vozila.* Banja Luka: Društvo za energetsku efikasnost.

An example of citing a chapter of a book in the text:

- (Harly, 1981)

In the reference list:

Harley, N. (1981). Radon risk models. U A. Knight, & B. Harrad (Eds.), *Indoor air and human health* (str. 69–78). Amsterdam: Elsevier.

An example of citing a paper published in the Scientific Conference Proceedings in the text:

- one author: (Grgurević, 2014);
- two authors: (Medić i Živadinović, 2014);
- three to five authors: first citing in text: (Krstić, Skorup, Skorup, 2014); second and every next citing in text: (Krstić et al., 2014);
- six and more authors: (Kojić et al., 2019).

In the reference list:

Grgurević, N. (2014). Kuba i Nikaragva (Revolucija i postrevolucionarni period). U M. Žiravac-Mladenović (Eds.), *Conference proceedings, International Scientific Conference on Social and Technological Development* (pp. 124-131). Banja Luka, B&H: University of Business Engineering and Management.

Medić, Z. i Živadinović, J. (2014). Neravnoteže i krize savremenog doba i ekonoska politika. U M. Žiravac-Mladenović (Eds.), *Conference proceedings, International Scientific Conference on Social and Technological Development* (pp. 102-1112). Banja Luka, B&H: University of Business Engineering and Management.

Krstić, M., Skorup, A. i Skorup, S. (2014). Inovativnost – ključni element preduzetničke strategije rasta i razvoja privrednog subjekta. In Žiravac-Mladenović, M. (Eds.), *Conference proceedings, International Scientific Conference on Social and Technological Development* (pp. 51-58). Banja Luka, B&H: University of Business Engineering and Management.

Kojić, D., Pavličević, J., Špírková, M., Aroguz, A., Jovičić, M., Bera, O., MarinovićCincović, M. (2019). THE IFLUENCE OF SILICA ON THE SOLVENT RESISTANCE OF POLYURETHANE HYBRIDE MATERIALS. In Gligorić, M., Došić, A. i Vujadinović, D. (Eds.), *Proceedings VI International Congress "Engineering, Environment and Materials in Processing Industry"* (pp. 568-572). Jahorina, BiH: University of East Sarajevo, Faculty of Technology.

An example of citing a master thesis or PhD thesis in the text:

- (Petrović, 2001)
- (Žiravac-Mladenović, 2009)

In the reference list:

Petrović, R. (2001). *Dehidratacija etera na mordenitnim katalizatorima.* Magistarski rad. Univerzitet u Banjoj Luci, Tehnološki fakultet, Banja Luka, BiH.

Žiravac-Mladenović M. (2009). *Bankarski nadzor i regulative zemalja u tranziciji na Balkanu – globalizacija bankarskog sektora.* Alfa Univerzitet, Beograd, Srbija.

An example of citing a publication of an institution as the author, downloaded from the Internet and citing a text from the web site

Citing internet sites should be avoided, but if it is necessary, then they should include names of the authors, if they are available, the title, internet site and access date.

In the text:

- institution: first citing in text (Zavod za statistiku Republike Srpske [ZSRS], 2009); second and every next citing (ZSRS, 2009);
- call to authors: (Degelman, 2000); - unknown author: (Compiere, 2017) (Purdue University, n.d)

In the reference list:

Zavod za statistiku Republike Srpske. (2009). Saopštenja. Preuzeto 10.02.2009. sa http://www.rzs.rs.ba/SaopstenjaRadLAT.htm

Degelman, D. (2000). APA Style Essentials. Retrieved May 18, 2000 from: http://www.vanguard.edu/psychology/apa.pdf

Compiere, (2017). Products. Preuzeto 11.10.2018. sa http://www.compiere.com/products/

Purdue University Writing Lab [Facebook page]. (n.d). Retrieved January 22, 2019, from https://www.facebook.com/PurdueUniversityWritingLab/

An example of citing laws, regulations, court decisions in text:

- laws and regulations: first citing in text (Zakon o krivičnom postupku [ZKP], 2014); second and every next citing (ZKP, 2014);
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In the reference list:

Zakonik o krivičnom postupku, Službeni glasnik RS, 72/2011, 101/2011, 121/2012, 32/2013, 45/2013, i 55/2014; Regulation (EU) No. 1052/2013 establishing the European Border Surveillance System (Eurosur), OJ L 295 of 6/11/2013, 1; Directive 2013/32/EU on common procedures for granting and withdrawing international protection (recast), OJ L 180 of 29/6/2013, 60.

Vrhovni sud Srbije, Rev. 1354/06, (6. 9. 2006). Paragraf Lex; Vrhovni sud Srbije, Rev. 2331/96, 3. 7. 1996, Bilten sudske prakse Vrhovnog suda Srbije 4/96, 27; CJEU, case C-20/12, Giersch and Others, ECLI:EU:C:2013:411, para. 16; Opinion of AG Mengozzi to CJEU, case C-20/12, Giersch and Others, ECLI:EU:C:2013:411, para. 16.

CONCLUSION

Papers not written strictly according to these guidelines shall not be accepted.

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2. MILOŠEVIĆ, Isidora, GRBIĆ, Milica, BJELICA, Biljana. Uticaj digitalnog marketinga na moderno poslovanje i oglašavanje : The impact of digital marketing on modern business and advertising. *STED journal : journal of social and technological development*. [Štampano izd.]. 2024, vol. 6, no. 2, pp. 73-83. ISSN 2637-2150. http://dx.doi.org/10.7251/STEDZ2402073M. [COBISS.RS-ID 141780737]
3. OLATOKUNBO, Demola Salami, OLAJIDE, Samuel Gbemisola, IVIC, Mladen. Renewable energy and it's role in expending access to electricity and economic growth in Nigeria. *STED journal : journal of social and technological development*. [Štampano izd.]. 2024, vol. 6, no. 2, pp. 64-72. ISSN 2637-2150. http://dx.doi.org/10.7251/STEDZ2402064S. [COBISS.RS-ID 141780225]
4. PHELE, Mokete, MTUNZI, Fanyana, SHOOTO, David. Adsorption of heavy metals from water using moringa olifera pods modified with iron oxide nanoparticles. *STED journal : journal of social and technological development*. [Štampano izd.]. 2024, vol. 6, no. 2, pp. 39-52. ISSN 2637-2150. http://dx.doi.org/10.7251/STEDZ2402039P. [COBISS.RS-ID 141779713]
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6. PHELE, Mokete John, MTUNZI, Fanyana Moses, MODISE, Joe, SHOOTO, David. Adsorption kinetics and thermodynamics of ciprofloxacin from aqueous solutions by magnetic iron oxide nanoparticles modified moringa pods. *STED journal : journal of social and technological development*. [Štampano izd.]. 2024, vol. 6, no. 2, pp. 10-24. ISSN 2637-2150. http://dx.doi.org/10.7251/STEDZ2402010P. [COBISS.RS-ID 141779201]
7. RISTIĆ, Sara V., . MOŠIĆ, Miloš S., PETKOVIĆ BENAZZOUZ, Marija M., LEKIĆ, Stefan, MILETIĆ, Katarina M. Advancing plant metabolism analysis: a real – time optical approach, insights from vriesea carinata wawra. *STED journal : journal of social and technological development*. [Štampano izd.]. 2024, vol. 6, no. 2, pp. 1-9. ISSN 2637-2150. http://dx.doi.org/10.7251/STEDZ2402001R. [COBISS.RS-ID 141778945]
8. TODOROVIĆ, Tanja. Rezultati primjene addenbrooke´s revidiranog testa kognitivne procjene: komparacija dva prikaza slučaja 53 = Results of the application of addenbrooke's revised cognitive test evaluations: comparison of two case reports. *STED journal : journal of social and technological development*. [Štampano izd.]. 2024, vol. 6, no. 2, pp. 53-63. ISSN 2637-2150. http://dx.doi.org/10.7251/STEDZ2402053T. [COBISS.RS-ID 141779969]

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